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Washington Basin Outlook Report March 1, 1998

Basin Outlook Reports
and
Federal - State - Private
Cooperative Snow Surveys

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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

Washington
Water Supply Outlook

March 1998

General Outlook

Overall Washington maintained near normal snowpack and precipitation levels. Areas that were above average received greater than normal amounts of precipitation and snowpack last month while areas that were already deprived didn't receive the much-needed moisture. "the wet got wetter and the dry got dryer". Current spring and summer runoff forecasts also reflect basin-to-basin water-year-to-date precipitation and snowpack accumulation. Reservoir storage is currently above average in most areas.

Snowpack

The March 1 statewide SNOTEL readings showed 112% of average snowpack; a slight increase from last month. Snowpack varied from 73% of average in the Pend Oreille River Basin to as high as 175% in the Sanpoil River Basin. Westside averages from SNOTEL, and March 1 snow surveys, included the North Puget Sound river basins with 93% of average, the Olympic Peninsula basins with 109%, and the Lewis-Cowlitz basins with 126% of average. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 113% of average, and the Wenatchee area with 103%. Snowpack in the Spokane River Basin remained below average at 83%, and the Pend Oreille River Basin, including Canadian data, had 73% of average. Maximum snow cover in Washington was at Cayuse Pass, with estimated water content of 78.3 inches. This site would normally have 65.3 inches of water content on March 1. The highest average in the state was the Mount Tolman snow course in the Sanpoil River Basin with 429% of average.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane	51	83
Newman Lake	61	103
Colville	N/A	N/A
Pend Oreille	49	73
Okanogan	75	98
Similkameen	63	77
Methow	77	109
Chelan	80	109
Wenatchee	70	103
Stemilt Creek	92	118
Yakima	70	113
Ahtanum Creek	74	104
Walla Walla	46	79
Cowlitz	74	116
Lewis	88	135
White	81	126
Green	55	87
Cedar	50	103
Snoqualmie	68	103
Skykomish	64	99
Skagit	71	100
Baker	71	94
Nooksack	63	85
Olympic Peninsula	102	109

Precipitation

During the month of February, the National Weather Service and Natural Resources Conservation Service climate stations showed considerable variations in precipitation across Washington. The highest percent of average in the state was at Conconully, near Okanogan. Conconully climate station reported 274% of average for a total of 3.83 inches. The February average for this site is 1.4 inches. Averages for the water year varied from 145% of average in the Okanogan - Methow Basin to 57% in the Spokane River Basin. The highest individual site average for the water year was 169% of average at Trough SNOTEL site near Wenatchee.

RIVER BASIN	FEBRUARY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	57	83
Colville-Pend Oreille	72	92
Okanogan-Methow	145	108
Wenatchee-Chelan	106	110
Yakima	92	108
Walla Walla	67	85
Cowlitz-Lewis	110	114
White-Green	76	97
Central Puget Sound	70	98
North Puget Sound	59	96
Olympic Peninsula	124	122

Reservoir

Less water is being released from storage reservoirs as we near the end of normal snowpack accumulation. Most reservoir operations are maintaining reduced capacity levels in anticipation of spring runoff. Reservoir storage in the Yakima Basin was 787,200 acre feet, or 113% of average. Storage at other reservoirs included Roosevelt at 93% of average and 49% of capacity; Banks Lake at 113% of average and 96% of capacity; and the Okanogan reservoirs with 146% of average for March 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 103,500 acre feet, or 69% of average and 43% of capacity; Chelan Lake, 335,700 acre feet, 200% of average and 50% of capacity; and the Skagit River reservoirs at 275% of average and 60% of capacity.

BASIN	PERCENT OF CAPACITY	PERCENT OF AVERAGE
Spokane	43	69
Colville-Pend Oreille	55	96
Okanogan-Methow	87	146
Wenatchee-Chelan	50	200
Yakima	74	113
North Puget Sound	60	275

For more information contact your local Natural Resources Conservation Service office.

Streamflow

Streamflow forecasts stayed about the same as last month with only a slight downward trend. Forecasts vary from 115% of average for Salmon Creek near Conconully, to 70% of average for the Spokane River near Post Falls. March forecasts for some Western Washington streams include: Cedar River near Cedar Falls, 90% of average; Green River, 83%; and the Dungeness River, 98%. Some Eastern Washington streams include the Yakima River near Parker, 95% of average; the Wenatchee River at Peshastin, 97%; and the Colville River at Kettle Falls, 88%. Volumetric forecasts are developed using current, historic, and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. A beneficial fact sheet, "Interpreting Streamflow Forecasts", is available on the World Wide Web at http://www.wcc.nrcs.usda.gov/factpub/factpub.html

Streamflows reported for February varied from well above to well below average. The Kettle River at Laurier, had the highest flows at 177% of average; and the Similkameen River at Nighthawk, with 51% of average, had the lowest flows in the state. Other streamflows were the following percentage of average: the Priest River, 117%; the Columbia at the International Boundary, 111%; the Spokane River at Spokane, 86%; the Columbia below Rock Island Dam, 99%; the Cle Elum River near Roslyn, 65%; and the Snake River below Ice Harbor Dam, 89%.

BASIN	PERCENT OF AVERAGE MOST PROBABLE FORECAST (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	70-73
Colville-Pend Oreille	71-110
Okanogan-Methow	83-115
Wenatchee-Chelan	87-104
Yakima	91-114
Walla Walla	85-95
Cowlitz-Lewis	95-114
Green River	83
Central Puget Sound	86-90
North Puget Sound	91-96
Olympic Peninsula	96-98

STREAM	PERCENT OF AVERAGE FEBRUARY STREAMFLOWS
Pend Oreille Below Box Canyon	80
Kettle at Laurier	177
Columbia at Birchbank	111
Spokane at Long Lake	84
Similkameen at Nighthawk	51
Okanogan at Tonasket	136
Methow at Pateros	114
Chelan at Chelan	139
Wenatchee at Pashastin	74
Yakima at Cle Elum	73
Yakima at Parker	92
Naches at Naches	71
Yakima at Kiona	111
Grande Ronde at Troy	76
Snake below Lower Granite Dam	88
SF Walla Walla near Milton Freewater	95
Columbia at The Dalles	94
Lewis at Ariel	103
Cowlitz below Mayfield Dam	69
Skagit at Concrete	65

For more information contact your local Natural Resources Conservation Service office.

BASIN SUMMARY OF SNOW COURSE DATA

MARCH 1998

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
ABERDEEN LAKE CAN.	4000	2/23/98	16	4.7	8.6	5.7
ABOVE ROLAND	4350				---	---
AHTANUM R.S.	3100	3/01/98	---	6.5E	9.5	6.8
ALPINE MEADOWS	3500	02/23/98	94	34.5	48.8	33.8
ALPINE MEADOWS PILL	3500	3/01/98	---	41.6S	55.7	37.1
AMBROSE	6480	2/26/98	36	8.4	17.9	11.0
ASHLEY DIVIDE	4820	2/24/98	15	4.4	11.7	6.4
BADGER PASS	6900				39.2	33.2
BADGER PASS PILLOW	6900	3/01/98	---	18.4	37.1	30.8
BAREE CREEK	5500				---	39.4
BAREE MIDWAY	4600	2/24/98	68	20.8	44.7	30.5
BAREE TRAIL	3800	2/24/98	19	5.6	18.2	8.6
BARKER LAKES PILLOW	8250	3/01/98	---	9.0	15.9	12.2
BARNES CREEK CAN.	4950				---	16.9
BASIN CREEK PILLOW	7180	3/01/98	---	7.2	8.4	6.5
BASSOO PEAK	5150	2/27/98	25	5.1	14.6	10.0
BEAVER CREEK TRAIL	2200	2/27/98	27	10.4	25.8	12.6
BEAVER PASS	3680	2/25/98	70	24.9	36.4	25.1
BEEHIVE SPRINGS (d)	4400				---	7.8
BELOW ROLAND	3920				---	---
BERNE-MILL CREEK (d)	3170	2/27/98	65	22.5	34.6	24.7
BIG BOULDER CREEK	3200				---	18.0
BIG CREEK	6750				---	37.4
BIG WHITE MTN CAN.	5100	3/01/98	50	15.6	20.9	15.9
BLACK MOUNTAIN	7750	2/25/98	46	12.2	17.9	12.2
BLACK PINE PILLOW	7100	3/01/98	---	6.6	14.5	10.5
BLACKWALL PEAK CAN.	6370	3/01/98	---	22.8	35.1	29.6
BLEWETT PASS #2	4270				---	14.3
BLEWETT PASS#2PILLOW	4270	3/01/98	---	15.2S	20.9	17.0
BLUE LAKE	5900	3/02/98	39	12.0	26.4	22.0
BRENDA MINE CAN.	4450	3/01/98	---	10.4	16.2	11.5
BRIEF	1600	02/25/98	21	7.2	13.1	6.9
BROOKMERE CAN.	3000	3/01/98	24	7.2	11.4	7.9
BROWN TOP AM	6000	2/25/98	145	48.2	60.5	51.9
BRUSH CREEK TIMBER	5000	2/26/98	17	4.2	9.8	8.6
BULL MOUNTAIN	6600	2/25/98	19	3.2	8.2	5.2
BUMPING LAKE	3450	02/26/98	56	18.0	---	14.0
BUMPING LAKE (NEW)	3400	3/01/98	---	24.6E	22.4	17.6
BUMPING RIDGE PILLOW	4600	3/01/98	---	26.7S	41.1	18.4
BUNCHGRASS MDWPILLOW	5000	3/01/98	---	24.0	37.9	22.7
BUTTE CREEK	4070				---	8.2
CAMP MISERY	6400				---	41.0
CARMI CAN.	3800	3/02/98	21	5.9	7.7	5.8
CARROL PASS	3650	3/01/98	---	30.0E	33.0	23.8
CAYUSE PASS	5300	3/01/98	---	78.3E	85.6	65.3
CEDAR GROVE	3760				---	11.0
CHESSMAN RESERVOIR	6200	2/24/98	9	1.8	3.8	3.4
CHEWALAH	4930				22.8	13.5
CHICKEN CREEK	4060	2/27/98	36	12.1	23.4	14.3
CHIWAUKUM G.S.	2500	02/27/98	27	11.0	18.5	10.7
CITY CABIN	2390	02/23/98	0	.0	18.0	12.3
CLOUDY PASS AM	6500	2/23/98	141	47.9	46.0	32.9
COLOCKUM PASS	5370				---	14.5
COMBINATION PILLOW	5600	3/01/98	---	3.5	7.4	5.1
COPPER BOTTOM PILLOW	5200	3/01/98	---	5.2	16.9	10.0
COPPER CAMP	6950				38.8	26.0
COPPER CREEK	5700	2/25/98	25	6.5	19.7	13.4
COPPER MOUNTAIN	7700	2/27/98	38	8.5	14.8	9.1
CORNER CREEK	3150	2/26/98	26	6.6	14.8	6.9
CORRAL PASS PILLOW	6000	3/01/98	---	30.2S	48.0	27.6
COTTONWOOD CREEK	6400	2/25/98	26	6.2	9.9	6.5
COUGAR MTN. PILLOW	3200	3/01/98	---	15.6S	30.8	18.6
COX VALLEY	4500	02/27/98	102	35.5	38.8	32.4
COYOTE HILL	4200	2/26/98	26	7.0	16.2	9.5
DALY CREEK PILLOW	5780	3/01/98	---	8.5	16.9	10.0
DEER PARK	5200	02/25/98	50	15.5	14.2	17.3
DESERT MOUNTAIN	5600	3/03/98	39	10.2E	20.3	13.2
DEVILS PARK	5900	2/25/98	86	32.2	43.6	36.9
DISCOVERY BASIN	7050	2/23/98	31	7.7	16.4	8.6
DIX HILL	6400	3/01/98	28	7.9	15.1	10.7
DOCK BUTTE AM	3800				71.0	56.1
DOMMERIE FLATS	2200	02/26/98	14	4.5	12.4	7.7
EAST FORK R.S.	5400	2/24/98	20	4.6	9.6	6.0
EAST RAGGED SADDLE	3740	3/02/98	55	19.9	31.5	17.7
EASY PASS AM	5200	3/01/98	---	61.3E	94.0	64.5
EL DORADO MINE	7800	2/28/98	58	15.4	22.6	16.7
ELBOW LAKE PILLOW	3200	3/01/98	---	28.4S	48.1	29.8
EMERY CREEK	4350				---	14.5
EMERY CREEK PILLOW	4350	3/01/98	---	8.8	21.2	14.0
ENDERBY CAN.	5800	2/23/98	96	31.9	40.6	32.7
ESPERON CK. MID CAN.	4250				---	12.2
ESPERON CK. UP CAN.	5050	2/28/98	40	11.7	19.3	14.3
FARRON CAN.	3700	2/27/98	43	11.7	15.9	11.9
FATTY CREEK	5500	2/25/98	48	13.4	37.2	20.2
FISH CREEK	8000	2/25/98	34	8.2	12.3	7.8
FISH LAKE	3370	02/26/98	81	31.0	39.4	29.3
FISH LAKE PILLOW	3370	3/01/98	---	28.3S	45.0	28.4
FLATTOP MTN PILLOW	6300	3/01/98	---	30.7	53.9	40.9
FLEECER RIDGE	7500	2/25/98	28	6.0	15.9	9.0
FOURTH OF JULY SUM	3200	2/25/98	19	6.6	15.8	8.4
FRED BURR PASS	8000				---	20.6
FREEZEOUT CK. TRAIL	3500	2/26/98	30	10.1	16.3	11.1
FROHNER MDWS PILLOW	6480	3/01/98	---	5.0	8.7	7.2
GIBBONS PASS	7100				---	19.8
GOAT CREEK	3600	02/25/98	23	6.8	8.9	6.4
GOLD CREEK LAKE	7200				---	12.3
GRANITE PEAK	6000				---	---
GRASS MOUNTAIN #2	2900	03/05/98	14	3.7	18.0	13.9
GRAVE CREEK	4300				21.1	15.7
GRAVE CRK PILLOW	4300	3/01/98	---	12.1	20.1	15.2
GRAYSTOKE LAKE CAN.	5500	2/25/98	29	8.4	16.4	13.3
GREEN LAKE	6000	3/01/98	---	35.9E	46.6	29.1
GREEN LAKE PILLOW	6000	3/01/98	---	21.6S	32.0	17.5
GREYBACK RES CAN.	4700	2/27/98	25	6.7	12.0	7.7
GRIFFIN CR DIVIDE	5150	2/27/98	21	4.8	15.0	10.0
GROUSE CAMP PILLOW	5380	3/01/98	---	18.3S	23.6	17.1
GUNSIGHT LAKE	6300				---	35.0
HAMILTON HILL CAN.	4550	2/28/98	30	8.7	15.6	13.2
HAND CREEK	5030				---	11.5
HAND CREEK PILLOW	5030	3/01/98	---	6.9	17.7	10.9
HARTS PASS PILLOW	6500	3/01/98	---	36.0S	44.7	34.6
HEART LAKE TRAIL	4800				---	19.2
HELL ROARING DIVIDE	5770	2/28/98	55	16.0	34.9	26.4
HERRIG JUNCTION	4850	2/26/98	58	18.2	34.1	21.7
HIGH RIDGE PILLOW	4980	3/01/98	---	16.4S	34.5	21.6
HOLBROOK	4530	3/01/98	---	5.4E	15.7	8.8
HOODOO BASIN PILLOW	6050	3/01/98	---	27.3	56.6	39.7
HOODOO CREEK	5900				51.6	39.2
HUMBOLDT GLCH PILLOW	4250	3/01/98	---	8.5	19.3	12.8
HURRICANE	4500	02/26/98	47	14.2	18.4	17.4
INTERGAARD	6450	2/26/98	26	6.2	11.6	6.8
ISINTOK LAKE CAN.	5100	2/24/98	17	4.3	6.7	6.3
JASPER PASS AM	5400				93.0	75.0
JUNE LAKE PILLOW	3200	3/01/98	---	40.2S	45.4	33.6
KELLER RIDGE	3700	02/26/98	21	5.3	10.0	4.4
KELLOGG PEAK	5560	3/02/98	66	23.4	40.1	26.3
KISHENEHN	3890	2/26/98	22	6.2	12.9	7.5
KIT CARSON PASTURE	4950	2/28/98	29	8.0	12.3	7.8
KLESILKWA CAN.	3450	3/05/98	28	8.7	20.0	11.1
KRAFT CREEK PILLOW	4750	3/01/98	---	9.4	25.1	14.5
KROMONA MINE	2400				35.9	29.1
LESTER CREEK	3100	03/05/98	52	17.0	31.6	17.7
LIGHTNING LAKE CAN.	3700	3/03/98	35	10.9	16.6	10.2
LOGAN CREEK	4300	2/26/98	16	3.8	10.5	6.7
LOLO PASS PILLOW	5240	3/01/98	---	19.2	40.6	28.0
LONE PINE PILLOW	3800	3/01/98	---	39.2S	46.2	28.1
LOOKOUT PILLOW	5140	3/01/98	---	22.3	40.9	28.0
LOST HORSE	5940				---	28.0
LOST HORSE MTN CAN.	5850	3/03/98	33	6.6	8.8	7.6
LOST HORSE PILLOW	5000	3/01/98	---	23.7S	28.2	25.6
LOST LAKE PILLOW	6110	3/01/98	---	33.8	79.7	52.7
LOWER SANDS CREEK #2	3120	3/02/98	44	15.9	30.4	16.9
LUBRECHT FOREST NO 3	5450	2/27/98	15	3.4	9.6	6.3
LUBRECHT FOREST NO 4	4650	2/27/98	7	1.4	6.6	3.1
LUBRECHT FOREST NO 6	4040	2/27/98	6	1.2	8.2	3.7
LUBRECHT HYDROPLOT	4200	2/27/98	14	3.4	9.6	6.4
LUBRECHT PILLOW	4680	3/01/98	---	4.5	8.9	5.8
LYMAN LAKE PILLOW	5900	3/01/98	---	58.0S	65.2	48.4
LYNN LAKE	4000	03/05/98	52	18.7	25.8	16.0
MARIAS PASS	5250	2/26/98	31	10.2	26.5	14.9
MARTEN LAKE AM	3600				78.0	63.6
MCCULLOCH CAN.	3900	2/27/98	20	6.0	7.6	6.1
MEADOWS CABIN	1900	2/27/98	3	1.0	14.4	6.2
MEADOWS PASS PILLOW	3240	3/01/98	---	22.0S	35.7	18.1
MERRITT	2140	2/27/98	30	11.6	22.7	14.4
MICA CREEK PILLOW	4750	3/01/98	---	17.3	45.1	---
MIDDLE SULTAN	3010				---	16.9
MINERAL CREEK	4000	2/27/98	42	14.4	28.0	15.9
MISSEZULA MTN CAN.	4700	2/27/98	24	6.1	10.2	8.8
MISSION (OMAK)	1150				---	3.0
MISSION CREEK CAN.	5800	3/01/98	41	13.3	7.4	17.2
MISSION RIDGE	5000	02/25/98	62	19.4	20.1	14.0
MONASHEE PASS CAN.	4200				---	11.9
MOOSE CREEK PILLOW	6200	3/01/98	---	11.5	25.7	14.5
MORRISSEY RIDGE CAN.	6100	3/01/98	---	18.6	31.0	25.4
MORSE LAKE PILLOW	5400	3/01/98	---	57.4S	71.4	38.5
MOSES MEADOWS (3)	3800				15.9	2.4
MOSES MOUNTAIN (1)	4800	02/27/98	81	24.7	20.8	14.4

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
MOSES MTN PILLOW	4800	3/01/98	---	15.2S	15.2	11.7
MOSES PEAK (2)	6650	02/25/98	53	15.5	6.8	10.3
MOSQUITO RDG PILLOW	5200	3/01/98	---	24.0	44.4	32.2
MOULTON RESERVOIR	6850	2/25/98	25	4.3	13.4	5.8
MT. BLUM AM	5800				77.0	55.9
MOUNT CRAG PILLOW	4050	3/01/98	---	36.8S	26.2	26.5
MT. KOBAU CAN.	5500	2/28/98	43	12.8	14.2	10.4
MOUNT TOLMAN	2000	02/23/98	4	15.0	6.1	3.5
MT. GARDNER	3300	02/23/98	32	10.3	39.0	14.2
MT. GARDNER PILLOW	2860	3/01/98	---	14.5S	24.9	14.2
MUTTON CREEK #1	5700	02/25/98	59	15.7	15.6	11.4
N.F. ELK CR PILLOW	6250	3/01/98	---	8.2	15.5	10.8
NEVADA CREEK PILLOW	6480	3/01/98	---	8.8	18.1	11.2
NEW HOZOMEEN LAKE	2800	2/26/98	24	10.7	17.3	10.9
NEZ PERCE CMP PILLOW	5650	3/01/98	---	10.4	19.1	13.0
NEZ PERCE PASS	6570	2/28/98	42	12.2	21.5	14.6
NOISY BASIN	6040				---	37.6
NOISY BASIN PILLOW	6040	3/01/98	---	26.6	57.6	33.7
NORTH FORK JOCKO	6330	2/25/98	85	29.1	55.4	38.2
OLALLIE MDWS PILLOW	3960	3/01/98	---	47.8S	73.9	44.6
OLALLIE MEADOWS	3630	3/01/98	---	41.5E	64.1	38.7
OLNEY PASS	3250				28.1	21.5
OPHIR PARK	7150	3/01/98	35	9.3	19.4	14.7
OYAMA LAKE CAN.	4100	2/26/98	22	5.9	9.5	5.9
PALISADE CREEK	8250				---	---
PARADISE PARK PILLOW	5500	3/01/98	---	58.3S	86.8	47.9
PARK CK RIDGE PILLOW	4600	3/01/98	---	40.8S	60.6	40.6
PETERSON MDW PILLOW	7200	2/23/98	---	7.1	12.5	8.5
PIGTAIL PEAK PILLOW	5900	3/01/98	---	42.9S	78.7	41.0
PIKE CREEK	5930				---	---
PIKE CREEK PILLOW	5930	3/01/98	---	14.2	33.1	22.8
PIPESTONE PASS	7200	2/26/98	18	4.1	7.0	4.1
POPE RIDGE PILLOW	3540	3/01/98	---	18.6S	27.0	16.7
POSTILL LAKE CAN.	4200	2/27/98	24	6.5	10.7	7.0
POTATO HILL PILLOW	4500	3/01/98	---	27.0S	33.5	21.9
QUARTZ PEAK PILLOW	4700	3/01/98	---	18.7	30.4	18.6
RAGGED MOUNTAIN	4200	3/02/98	58	20.5	32.9	16.4
RAGGED RIDGE	3330	2/27/98	25	8.2	13.5	7.4
RAINY PASS PILLOW	4780	3/01/98	---	28.9S	46.6	32.7
REX RIVER PILLOW	1900	3/01/98	---	26.6S	36.0	20.1
ROCKER PEAK PILLOW	8000	3/01/98	---	10.5	15.4	12.6
ROCKY CREEK AM	2100	3/01/98	---	23.1E	37.0	25.2
ROLAND SUMMIT	5120	3/01/98	77	27.0	49.7	28.6
RUSTY CREEK	4000	02/25/98	30	8.0	9.3	6.2
SF THUNDER CK AM	2200				14.0	7.9
SADDLE MTN PILLOW	7900	3/01/98	---	17.8	33.0	21.9
SAGE CREEK SADDLE	4080	2/26/98	49	15.4	28.5	15.9
SALMON MDWS PILLOW	4500	3/01/98	---	12.9S	15.8	8.3
SASSE RIDGE PILLOW	4200	3/01/98	---	32.3S	49.7	27.4
SAVAGE PASS PILLOW	6170	3/01/98	---	17.7	32.1	22.9
SAWMILL RIDGE	4700	03/05/98	87	29.4	52.7	29.7
SCHREIBERS MDW AM	3400	3/01/98	---	45.5E	53.0	47.9
SHEEP CANYON PILLOW	4050	3/01/98	---	36.6S	30.0	30.1
SILVER STAR MTN CAN.	5600	3/01/98	66	21.6	30.1	23.9
SKALKAHO PILLOW	7260	3/01/98	---	17.1	32.4	20.8
SKITWISH RIDGE	5110	3/02/98	76	26.2	47.9	27.5
SKOOKUM CREEK PILLOW	3920	3/01/98	---	22.9S	32.5	24.9
SLIDE ROCK MOUNTAIN	7100	2/28/98	34	9.5	18.4	13.3
SPENCER MDW PILLOW	3400	3/01/98	---	38.9S	42.2	27.2
SPIRIT LAKE PILLOW	3100	3/01/98	---	6.6S	3.4	6.6
SPOTTED BEAR MTN.	7000	3/02/98	24	7.5	19.4	13.3
STAHL PEAK PILLOW	6030	3/01/98	---	25.7	38.7	30.2
STAMPEDE PASS PILLOW	3860	3/01/98	---	35.6S	56.0	38.2
STEMILT SLIDE	5000	02/25/98	54	16.9	16.5	12.7
STEMPLE PASS	6600	3/02/98	22	5.0	12.3	8.5
STEVENS PASS PILLOW	4070	3/01/98	---	33.3S	56.0	34.7
STEVENS PASS SAND SD	3700	2/27/98	77	25.5	50.9	31.1
STICKNEY RIDGE	3640				49.7	59.8
STORM LAKE	7780	2/24/98	38	9.1	15.9	10.8
STRANGER MOUNTAIN	4230				---	10.8
STRYKER BASIN	6180	2/26/98	70	22.0	38.8	28.5
STUART MOUNTAIN	7400	2/25/98	64	19.8	43.5	27.4
SUMMERLAND RES CAN.	5050	2/23/98	22	6.1	11.0	8.4
SUMMIT G.S.	4600	02/25/98	31	7.7	10.9	7.1
SUNDAY SUMMIT CAN.	4000				---	5.4
SUNSET PILLOW	5540	3/01/98	---	13.3	41.2	32.0
SURPRISE LKS PILLOW	4250	3/01/98	---	52.6S	59.4	37.5
TEN MILE LOWER	6600	2/24/98	18	3.6	9.1	6.3
TEN MILE MIDDLE	6800	2/24/98	25	6.0	12.9	9.5
THUNDER BASIN	4200	2/27/98	52	15.8	32.0	18.5
TINKHAM CREEK PILLOW	3000	3/01/98	---	25.6S	44.0	17.2
TOGO	3370				---	9.3
TOUCHET #2 PILLOW	5530	3/01/98	---	22.3	49.4	27.8
TRAPPING CK LOW CAN.	2850	3/01/98	14	3.9	7.0	5.0
TRAPPING CK UP CAN.	4100	3/01/98	23	7.2	9.9	7.9
TRINKUS LAKE	6100	3/02/98	71	25.8	55.7	36.7
TROUGH #2 PILLOW	5310	3/01/98	---	13.5S	12.1	9.0
TROUT CREEK CAN.	5650	2/23/98	21	5.5	8.2	6.5
TRUMAN CREEK	4060	2/24/98	9	2.8	9.0	5.0
TUNNEL AVENUE	2450	02/27/98	50	18.6	30.7	19.2
TV MOUNTAIN	6800	2/25/98	35	8.2	24.8	15.6
TWELVEMILE PILLOW	5600	3/01/98	---	13.3	24.9	16.4
TWIN CAMP	4100	03/05/98	53	16.2	33.5	21.8
TWIN CREEKS	3580	3/02/98	18	5.5	18.5	10.7
TWIN LAKES	2700	02/24/98	26	8.7	10.6	8.7
TWIN LAKES PILLOW	6400	3/01/98	---	28.2	53.6	34.3
TWIN SPIRIT DIVIDE	3480	3/02/98	39	13.1	24.2	13.8
UPPER HOLLAND LAKE	6200	3/02/98	66	23.6	45.1	30.4
UPPER WHEELER PILLOW	4400	3/01/98	---	12.4S	15.3	12.1
VASEUX CREEK CAN.	4250	2/27/98	19	4.9	6.9	5.5
WARM SPRINGS PILLOW	7800	3/01/98	---	16.2	25.7	18.2
WATSON LAKES AM	4500				65.0	53.3
WEASEL DIVIDE	5450	2/24/98	65	22.2	35.8	29.5
WELLS CREEK PILLOW	4200	3/01/98	---	25.3S	36.9	33.2
WHITE PASS ES PILLOW	4500	3/01/98	---	20.0S	45.9	20.7
WHITE ROCKS MTN CAN.	7200	2/27/98	54	17.9	22.9	19.3

(d) Denotes discontinued site.

Natural Resources Conservation Service

Washington State
Snow, Water and Climate Services

Contact List

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cpacheco@wcc.nrcs.usda.gov

Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
http://wcp.wsu.edu/nrcs/CoopSnoSrvy.htm

Oregon:
http://crystal.or.nrcs.usda.gov/snowsurveys/

Idaho:
http://id.nrcs.usda.gov/snow/snow.htm

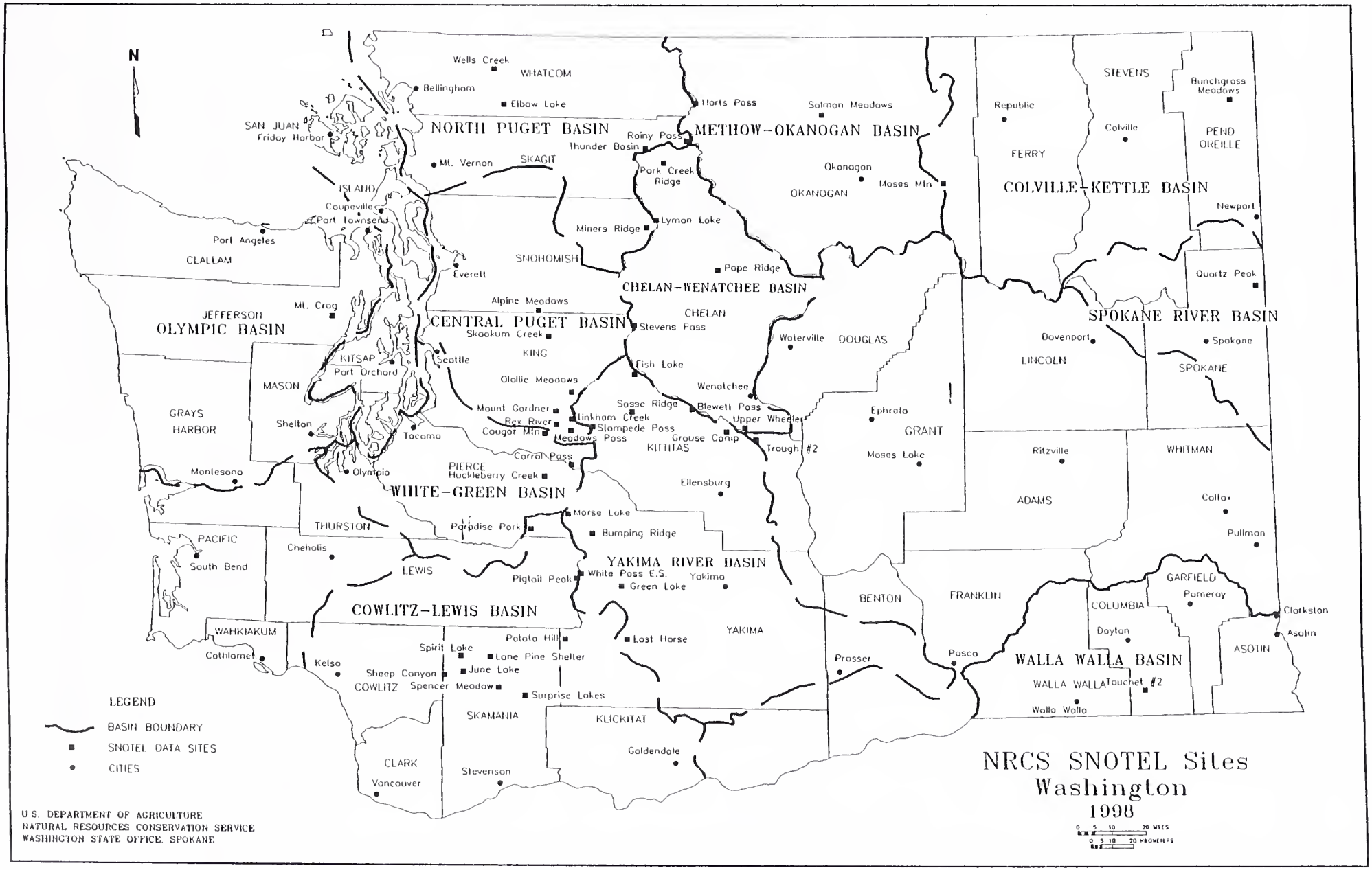
National Water and Climate Center (NWCC):
http://www.wcc.nrcs.usda.gov/

NWCC Anonymous FTP Server:
ftp.wcc.nrcs.usda.gov

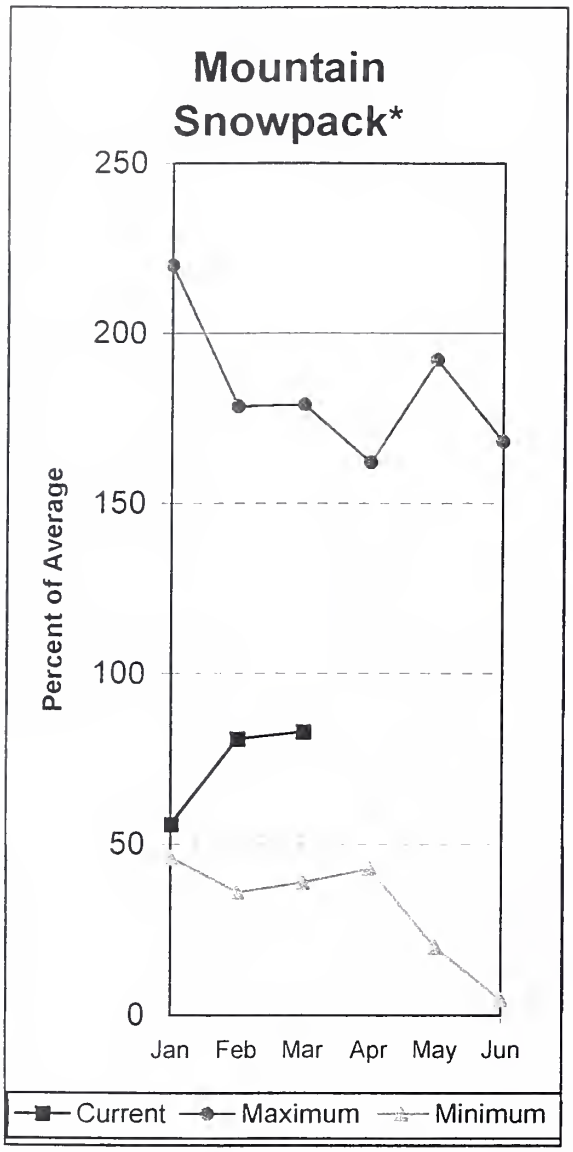
USDA-NRCS Agency Homepages

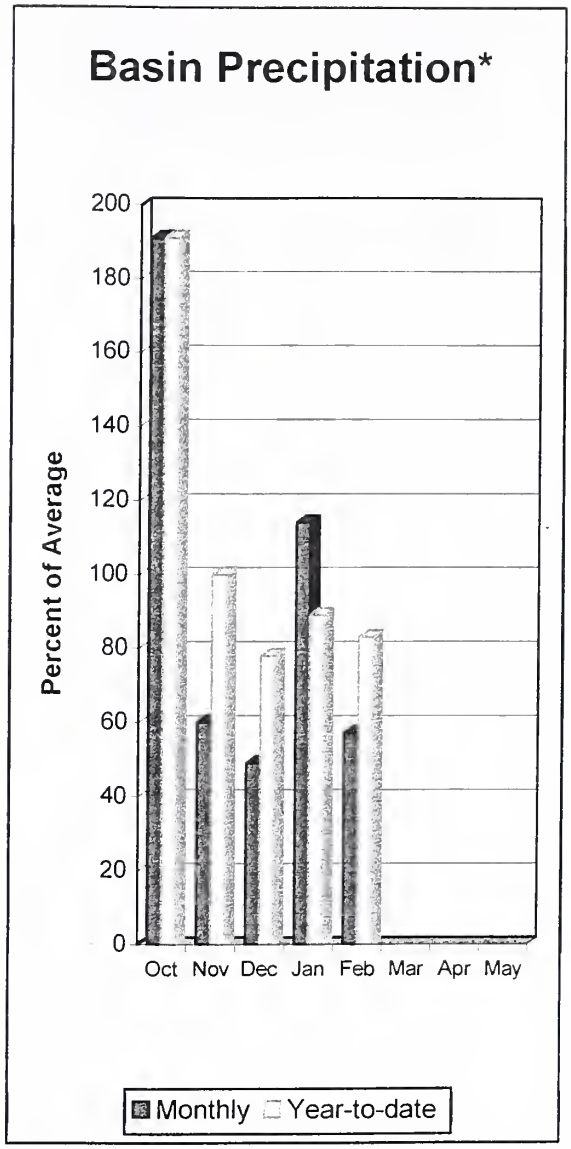
Washington:
http://wcp.wsu.edu/nrcs/

NRCS National:
http://www.ftw.nrcs.usda.gov/


N
Wells Creek
WHATCOM
Bellingham
Elbow Lake
Horts Pass
Salmon Meadows
NORTH PUGET BASIN
METHOW-OKANOGAN BASIN
SAN JUAN
Friday Harbor
Rainy Pass
Thunder Basin
Mt. Vernon
SKAGIT
Park Creek Ridge
Okonogan
Moses Mtn
OKANOGAN
ISLAND
Coupeville
Port Townsend
Miners Ridge
Lyman Lake
Port Angeles
CLALLAM
SNOHOMISH
Everett
Pope Ridge
CHELAN-WENATCHEE BASIN
Alpine Meadows
Mt. Crag
JEFFERSON
OLYMPIC BASIN
CENTRAL PUGET BASIN
CHELAN
Stevens Pass
Skookum Creek
KITSAP
Port Orchard
Seattle
KING
Waterville
DOUGLAS
Fish Lake
MASON
Olallie Meadows
Wenatchee
Mount Gardner
Sasse Ridge
Blewett Pass
GRAYS HARBOR
Shelton
Rex River
Tinkham Creek
Upper Wheeler
Ephrata
Tacoma
Cougar Mtn
Slompede Pass
Meadows Pass
Grouse Camp
KITTITAS
GRANT
Trough #2
Moses Lake
Corral Pass
Montesano
Olympio
PIERCE
Huckleberry Creek
WHITE-GREEN BASIN
Ellensburg
Morse Lake
THURSTON
Paradise Park
Bumping Ridge
PACIFIC
South Bend
Chehalis
YAKIMA RIVER BASIN
White Pass S.S.
Yakima
LEWIS
Pigtail Peak
Green Lake
COWLITZ-LEWIS BASIN
BENTON
FRANKLIN
YAKIMA
WAHKIAKUM
Potato Hill
Lost Horse
Spirit Lake
Lone Pine Sheller
Cathlamet
Kelso
Sheep Canyon
June Lake
COWLITZ
Spencer Meadow
Surprise Lakes
Prosser
Pasco
WALLA WALLA BASIN
WALLA WALLA
Touchet #2
Wallo Wallo
SKAMANIA
KLICKITAT
Goldendale
CLARK
Vancouver
Stevenson
LEGEND
BASIN BOUNDARY
SNOTEL DATA SITES
CITIES
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
WASHINGTON STATE OFFICE, SPOKANE
STEVENS
Republic
Colville
Bunchgrass Meadows
PEND OREILLE
FERRY
COLVILLE-KETTLE BASIN
Newport
Quartz Peak
SPOKANE RIVER BASIN
Davenport
Spokane
LINCOLN
SPOKANE
Ritzville
WHITMAN
ADAMS
Colfax
Pullman
GARFIELD
Pomeroy
COLUMBIA
Clarkston
Dayton
Asotin
ASOTIN
NRCS SNOTEL Sites
Washington
1998
0 5 10 20 MILES
0 5 10 20 KILOMETERS

Spokane River Basin





*Based on selected stations

The March 1 forecasts for summer runoff within the Spokane River Basin are 70% of average near Post Falls and 73% of average at Long Lake. These forecasts dropped slightly from last month. The forecast is based on a basin snowpack that is 83% of average and precipitation that is 83% of average for the water year. Precipitation for February was much below normal at only 57% of average. Streamflow on the Spokane River at Long Lake, was 84% of average for February. March 1 storage in Coeur d'Alene Lake, was 103,500 acre feet, 69% of average, and 43% of capacity. Snowpack at Quartz Peak SNOTEL site contained 18.7 inches of water, compared to the average March 1 reading of 18.6 inches. Average temperatures in the Spokane Basin were 2 degrees above normal.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

SPOKANE near Post Falls (2)	APR-SEP	1461	1853	2120	79	2387	2779	2730
	APR-JUL	1400	1787	2050	79	2313	2700	2633
SPOKANE at Long Lake	APR-JUL	1635	2049	2330	79	2611	3025	2936
	APR-SEP	1796	2224	2515	80	2806	3234	3159

SPOKANE RIVER BASIN
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
COEUR D'ALENE	238.5	104.5	116.5	127.8

SPOKANE RIVER BASIN
Watershed Snowpack Analysis - March 1, 1998

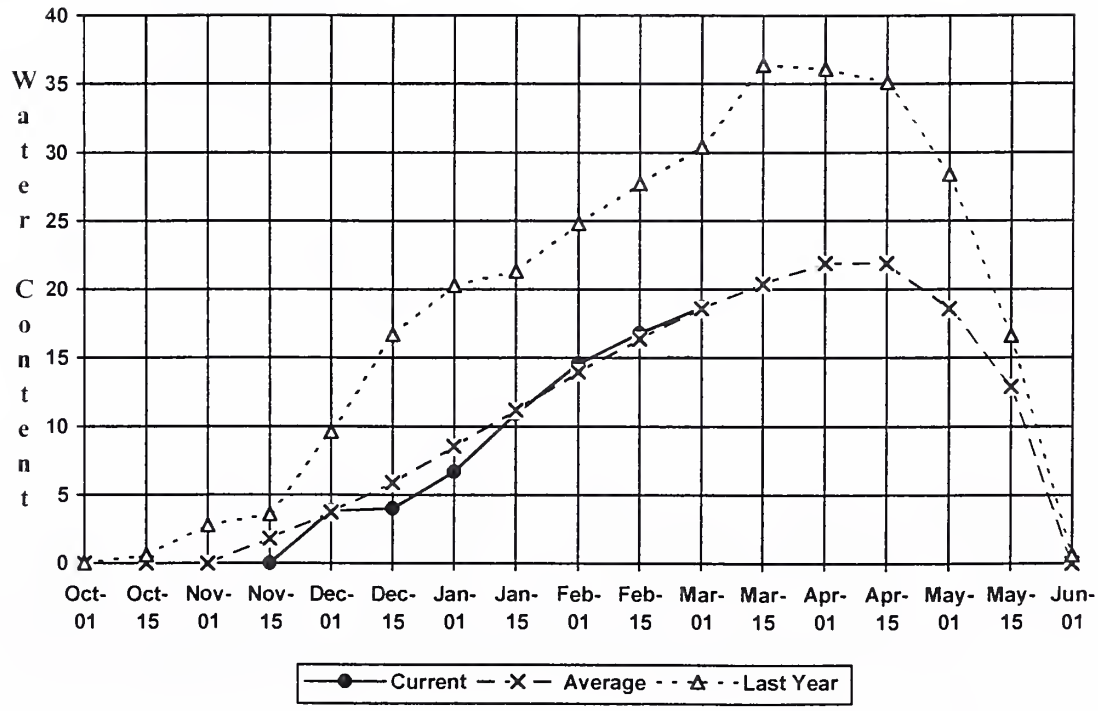
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
SPOKANE RIVER	11	50	81
NEWMAN LAKE	2	62	110

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

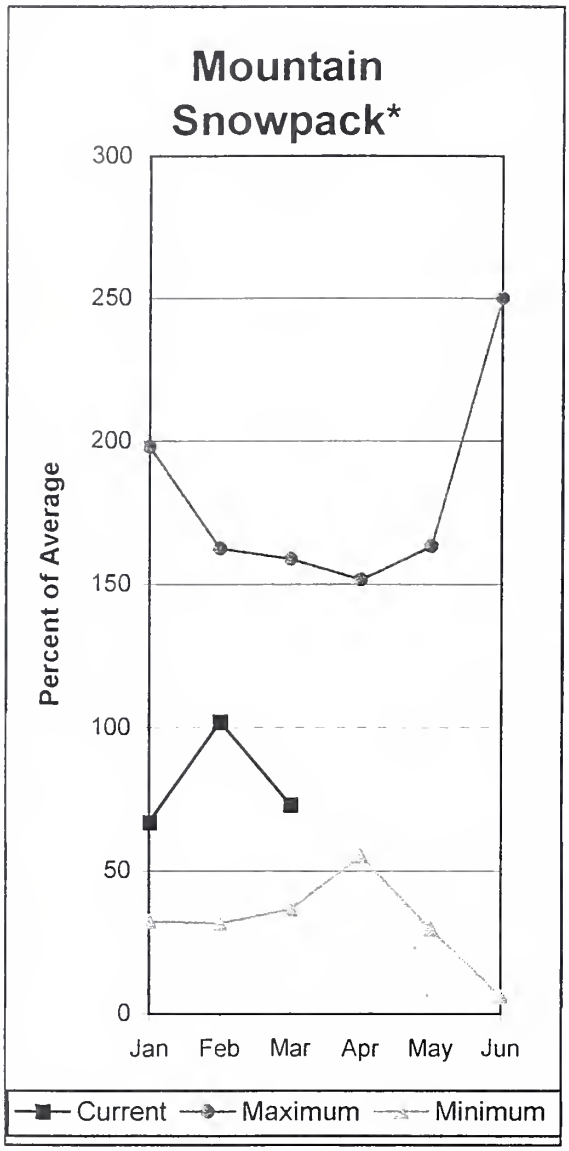
The average is computed for the 1961-1990 base period.

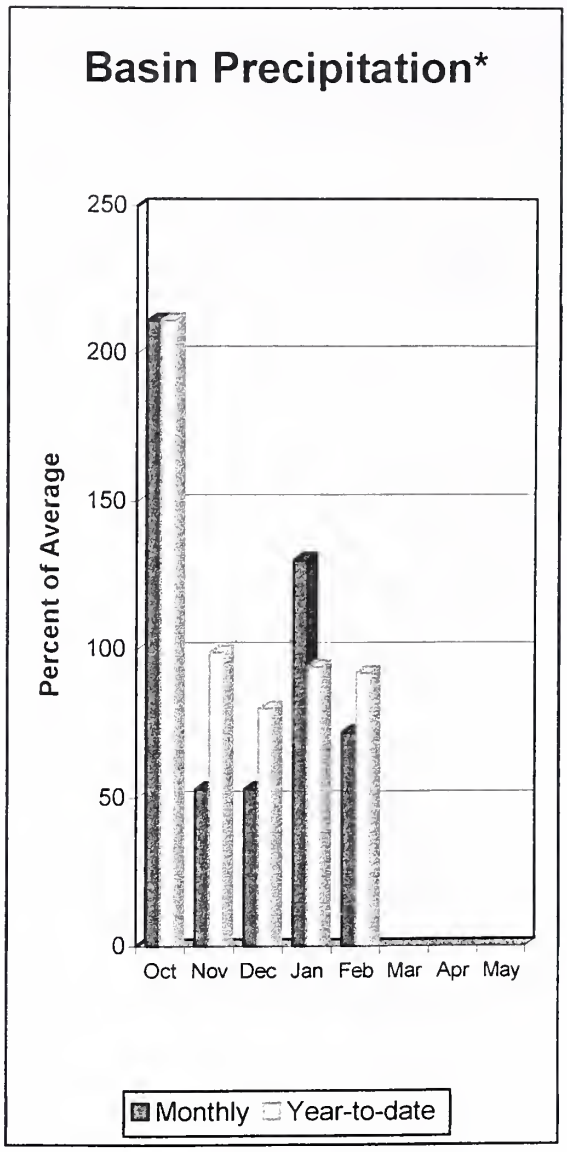
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Quartz Peak SNOTEL
Elevation 4700 ft.



Colville - Pend Oreille River Basins





*Based on selected stations

The forecast for the Kettle River streamflow is 110% of average; the Pend Oreille below Box Canyon. 70%: and the Priest River near the town of Priest River, 77% of average for the summer runoff period. February streamflow was 80% of average on the Pend Oreille River; 111% on the Columbia at the International Boundary; and 177% on the Kettle River. March 1 snow cover was 73% of average in the Pend Oreille Basin and 92% of average in the Kettle River Basin. Precipitation during February was 72% of average, bringing the year-to-date precipitation to 92% of average. Reservoir storage in Roosevelt and Banks lakes was reported to be 96% of average and 55% of capacity on March 1. Average temperatures were 2-3 degrees above normal.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
PEND OREILLE Lake Inflow (1,2)	APR-JUL	6578	9206	10400	79	11594	14222	13150
	APR-SEP	7120	9995	11300	79	12605	15480	14370
	APR-JUN	5392	7873	9000	79	10127	12608	11390
PRIEST nr Priest River (1,2)	APR-JUL	432	620	705	87	790	978	814
	APR-SEP	458	659	750	86	841	1042	868
PEND OREILLE bl Box Canyon (1,2)	APR-JUL	7025	9415	10500	79	11585	13975	13380
	APR-SEP	7707	10315	11500	79	12685	15293	14590
	APR-JUN	6150	8206	9140	79	10074	12130	11570
CHAMOKANE CREEK near Long Lake	MAY-AUG	2.32	5.08	6.95	82	8.82	11.58	8.52
COLVILLE at Kettle Falls	APR-SEP	66	90	107	82	124	148	131
	APR-JUL	59	82	98	82	114	137	120
	APR-JUN	55	77	92	83	107	129	111
KETTLE near Laurier	APR-SEP	1665	1882	2030	110	2178	2395	1854
	APR-JUL	1598	1795	1930	110	2065	2262	1761
	APR-JUN	1454	1624	1740	110	1856	2026	1585

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

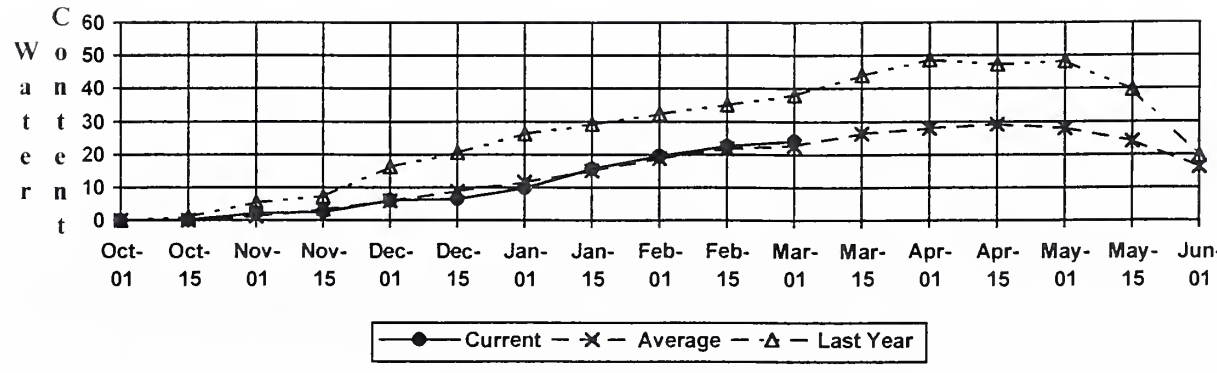
COLVILLE - PEND OREILLE RIVER BASINS
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
ROOSEVELT		NO REPORT		
BANKS		NO REPORT		

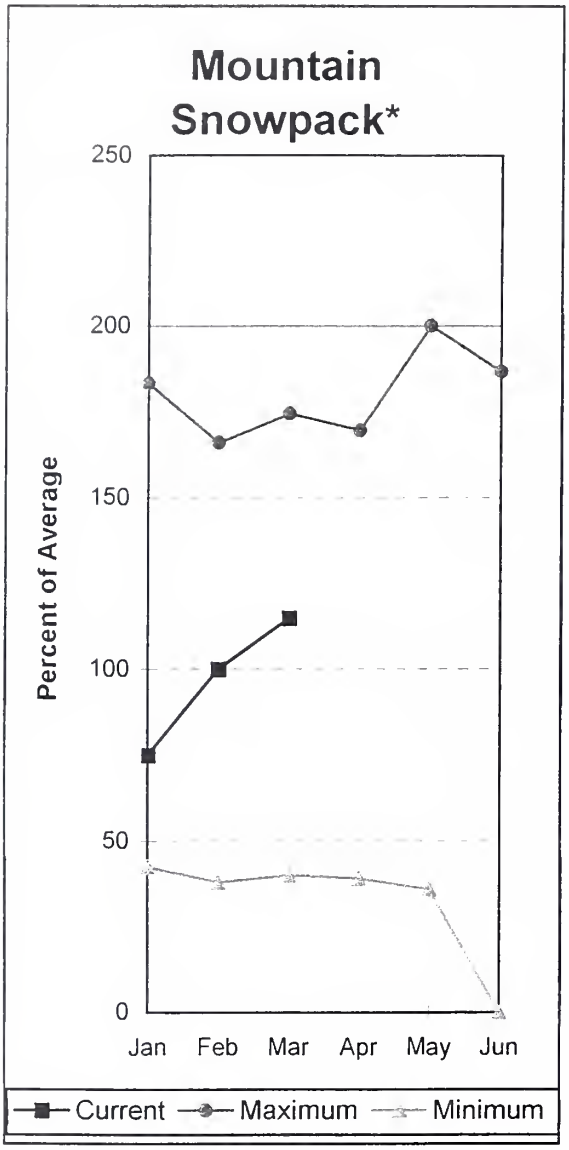
COLVILLE - PEND OREILLE RIVER BASINS
Watershed Snowpack Analysis - March 1, 1998

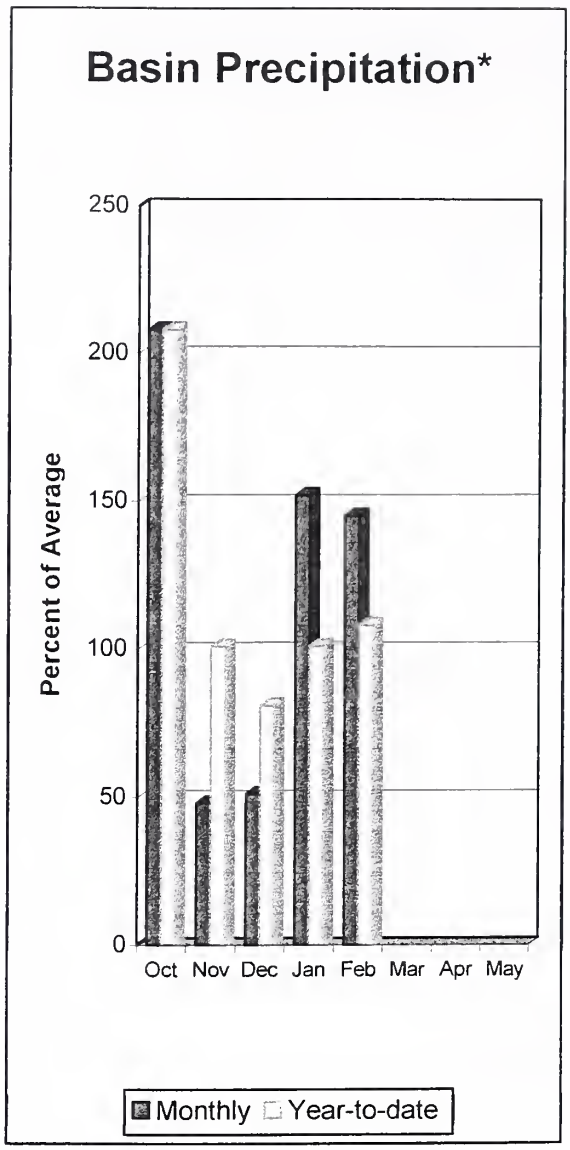
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
COLVILLE RIVER	1	75	101
PEND OREILLE RIVER	67	50	82
KETTLE RIVER	3	68	103

Bunchgrass Meadow SNOTEL
Elevation 5000 ft.--



Okanogan - Methow River Basins





*Based on selected stations

Summer runoff forecast for the Okanogan River is 83% of average; the Similkameen River, 83%; the Methow River, 102%; and Salmon Creek, 115% of average. March 1 snow cover on the Okanogan was 98% of average; the Methow, 109%; and the Similkameen River, 77%. Salmon Meadows SNOTEL site above Conconully Lake had a March 1 reading of 155% of average. February precipitation in the Okanogan-Methow was 145% of average, with precipitation for the water year at 108% of average. February streamflow for the Methow River was 114% of average; 136% for the Okanogan River; and 51% for the Similkameen. Snow-water-content at the Salmon Meadows SNOTEL, near Conconully, was 12.9 inches. Average for this site is 8.3 inches on March 1.. Combined storage in the Conconully Reservoirs was 20.500 acre feet, which is 87% of capacity and 147% of the March 1 average.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<=== Drier === Future Conditions === Wetter ===>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SIMILKAMEEN near Nighthawk (1)	APR-JUL	810	1033	1135	87	1237	1460	1304
	APR-SEP	900	1120	1220	87	1320	1540	1399
	APR-JUN	647	859	955	86	1051	1263	1113
OKANOGAN near Tonasket (1)	APR-JUL	555	1040	1260	86	1480	1965	1466
	APR-SEP	630	1156	1395	86	1634	2160	1623
	APR-JUN	477	878	1060	86	1242	1643	1233
SALMON CREEK near Conconully	APR-JUL	7.6	14.9	19.9	104	25	32	19.1
	APR-SEP	8.3	15.7	21	104	26	33	20
METHOW RIVER near Pateros	APR-SEP	740	853	930	99	1007	1120	942
	APR-JUL	693	795	864	99	933	1035	873
	APR-JUN	588	678	739	99	800	890	746

OKANOGAN - METHOW RIVER BASINS
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
SALMON LAKE	10.5	8.7	8.4	7.5
CONCONULLY RESERVOIR	13.0	10.8	9.0	6.3

OKANOGAN - METHOW RIVER BASINS
Watershed Snowpack Analysis - March 1, 1998

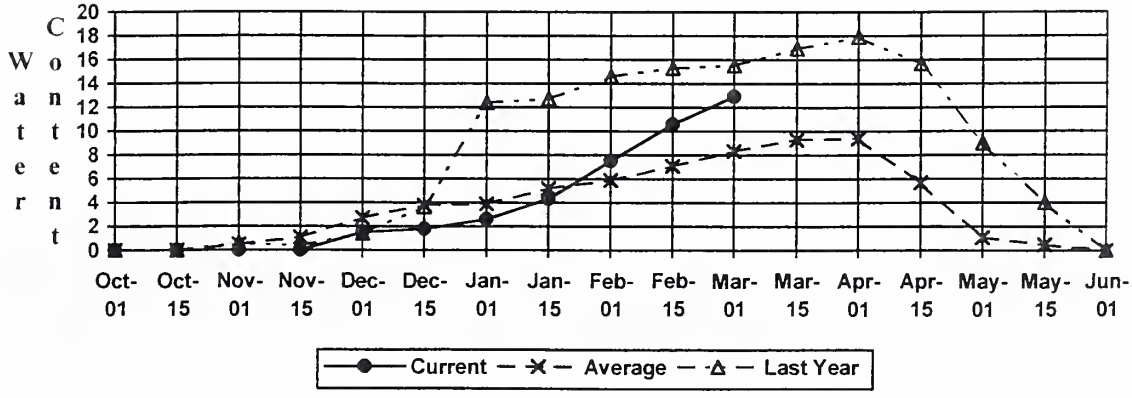
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
OKANOGAN RIVER	18	64	96
OMAK CREEK	1	66	90
SANPOIL RIVER	0	0	0
SIMILKAMEEN RIVER	4	62	85
CONCONULLY LAKE	3	51	101
METHOW RIVER	5	59	102

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

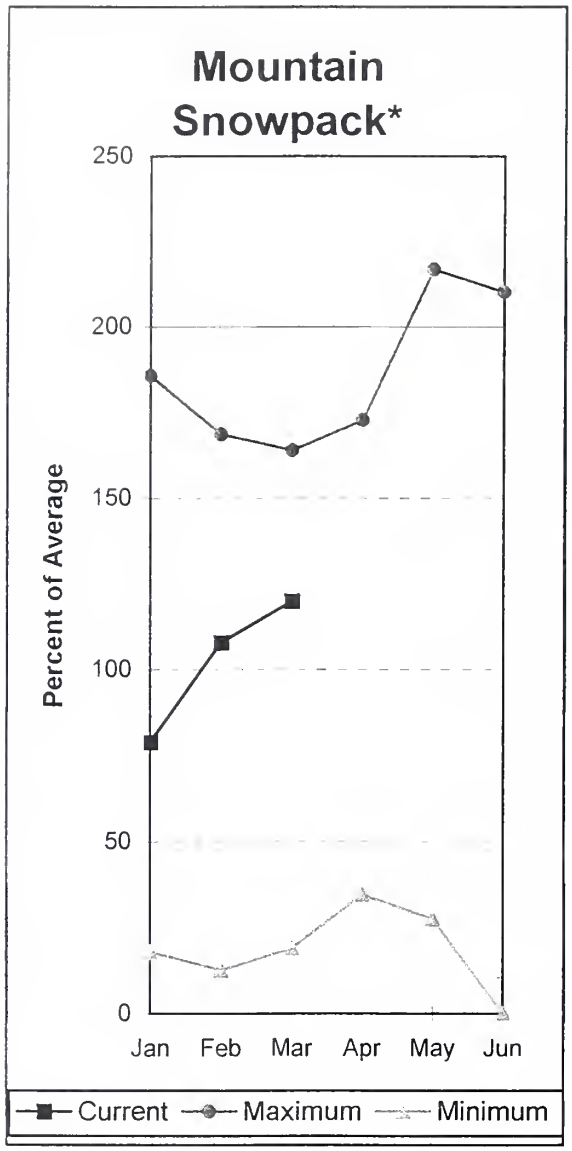
The average is computed for the 1961-1990 base period.

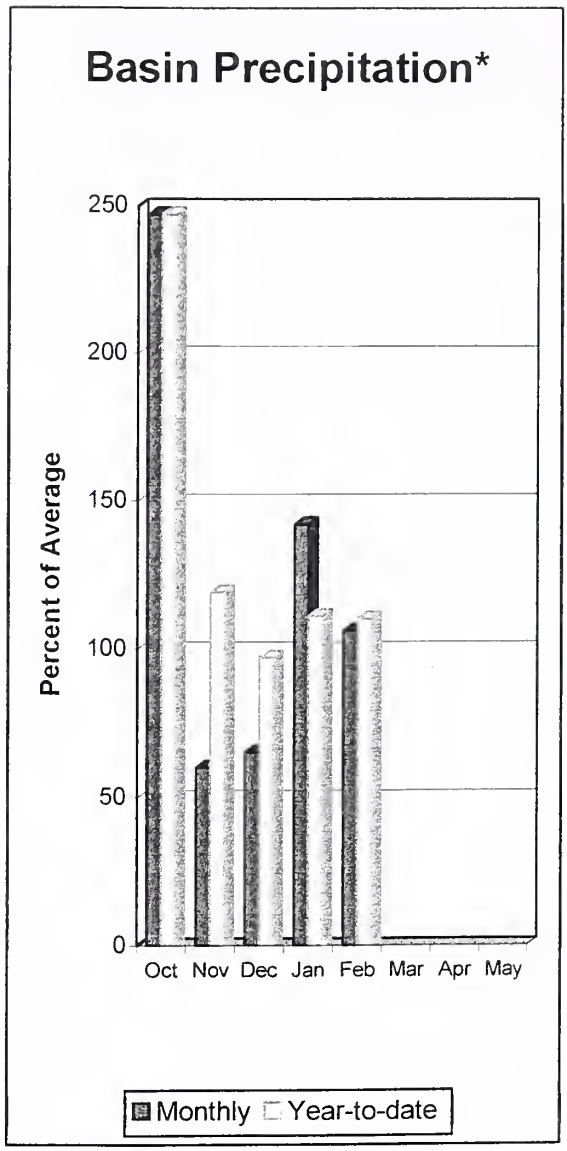
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Salmon Meadows SNOTEL
Elevation 4500 ft.



Wenatchee - Chelan River Basins





*Based on selected stations

Precipitation during February was 106% of average in the basin and 110% for the year-to-date. Runoff for the Entiat River is forecast to be 104% of average for the summer. The April-September forecast for the Chelan River is for 98% of average; for the Wenatchee River at Peshastin it is 97%; and for the Stehekin it is 100% of average. Icicle, Stemilt and Squilchuck creeks are all expected to have near normal flows this summer. February streamflows on the Chelan River was 139% of average, and the Wenatchee River averaged 74% of normal flows. March 1 snowpack in the Wenatchee Basin was 103% of average. The Chelan Basin was 109% of average; Colockum Ridge was 150%; and Stemilt Creek was 118% of average. Snowpack in the Entiat River Basin was 109% of average. Reservoir storage in Lake Chelan was 335,700 acre feet, or 200% of March 1 average and 50% of capacity. Lyman Lake SNOTEL had the most snow water with 58 inches of water. This site would normally have 48.4 inches on March 1. Temperatures were slightly above normal for February.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
CHELAN RIVER near Chelan	APR-SEP	943	1049	1120	97	1191	1297	1160
	APR-JUL	841	930	990	97	1050	1139	1024
	APR-JUN	662	738	789	97	840	916	812
STEHEKIN near STEHEKIN	APR-SEP	706	774	820	99	866	934	827
	APR-JUL	550	603	640	91	677	730	701
	APR-JUN	454	499	530	99	561	606	538
ENTIAT RIVER near Ardenvoir	APR-SEP	168	193	210	93	227	252	227
	APR-JUL	152	175	190	92	205	228	206
	APR-JUN	122	142	155	92	168	188	169
WENATCHEE at Plain	APR-SEP	942	1048	1120	94	1192	1298	1190
	APR-JUL	880	958	1010	94	1062	1140	1072
	APR-JUN	721	777	815	94	853	909	864
WENATCHEE R. at Peshastin	APR-SEP	1014	1351	1580	97	1809	2146	1636
	APR-JUL	919	1223	1430	96	1637	1941	1485
	APR-JUN	745	989	1155	96	1321	1565	1204
STEMILT nr Wenatchee (miners in)	MAY-SEP	77	105	124	90	143	171	138
ICICLE CREEK near Leavenworth	APR-SEP	277	301	317	92	333	357	344
	APR-JUL	256	278	293	92	308	330	318
	APR-JUN	205	228	244	93	260	283	263

WENATCHEE - CHELAN RIVER BASINS
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CHELAN LAKE	676.1	390.0	288.3	450.6

WENATCHEE - CHELAN RIVER BASINS
Watershed Snowpack Analysis - March 1, 1998

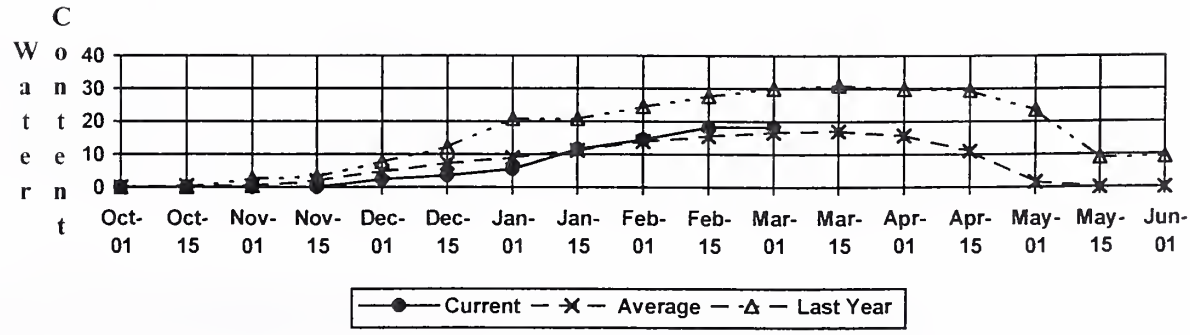
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
CHELAN LAKE BASIN	5	69	107
ENTIAT RIVER	2	60	110
WENATCHEE RIVER	13	68	110
SQUILCHUCK CREEK	0	0	0
STEMILT CREEK	2	71	98
COLOCKUM CREEK	1	102	195

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

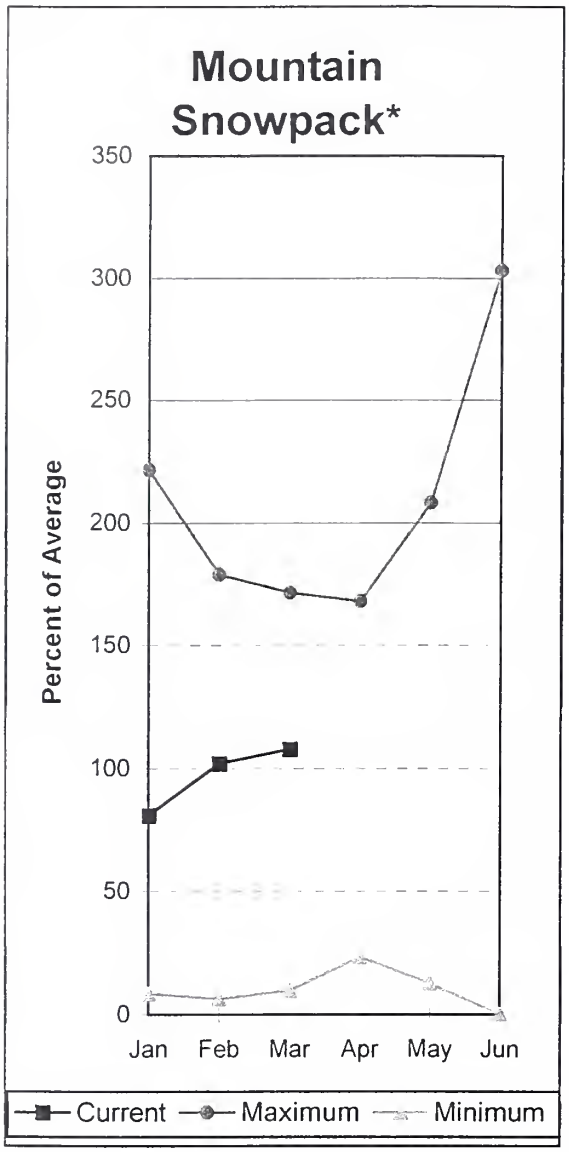
The average is computed for the 1961-1990 base period.

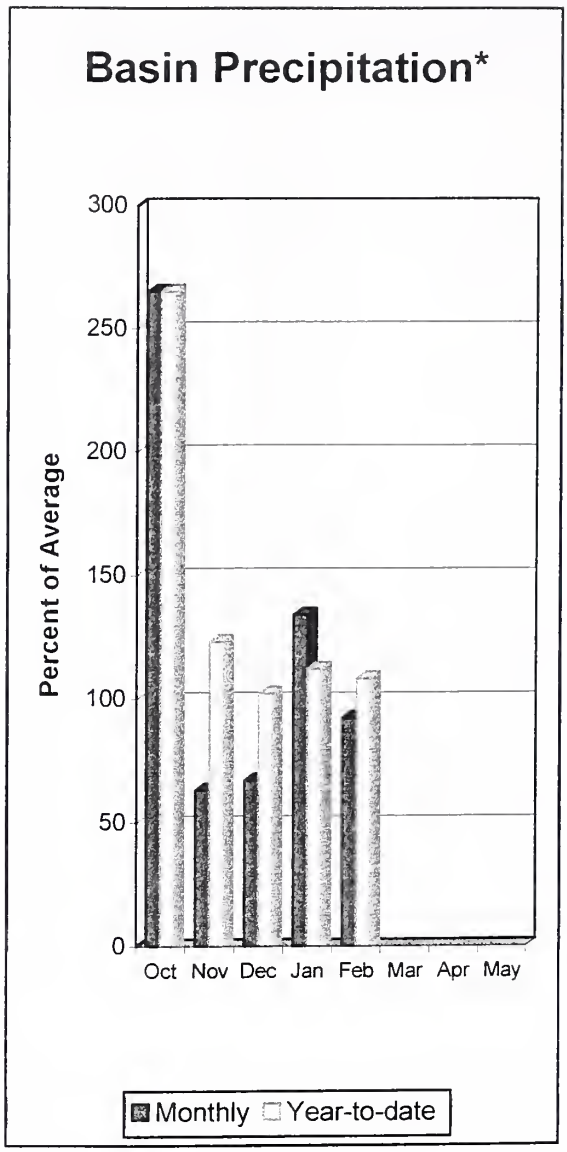
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Pope Ridge SNOTEL
Elevation 3540 ft.



Yakima River Basin





*Based on selected stations

March 1 reservoir storage for the five major reservoirs was 787,200 acre feet, or 113% of average. March 1 summer streamflow forecasts are for near normal in the Yakima Basin. Forecasts for the Yakima River at Cle Elum, are for 91% of average; Naches River, 100%; the Yakima River near Parker, 95%; Ahtanum Creek, 98%; and the Tieton River, 103%. The Klickitat River near Glenwood is forecast at 114% of average flows this summer. Volume forecasts for the Yakima Basin are for natural flow. As such, they may differ from the U.S. Bureau of Reclamation's forecast for the total water supply available. which includes irrigation return flow. February streamflows within the basin were: the Yakima River near Kiona, 111% of average; the Yakima near Cle Elum, 73%; and the Naches River at 71%. March 1 snowpack was 113% based upon 20 snow courses and SNOTEL readings within the Yakima Basin. Precipitation was 92% of average for February and 108% for the water year-to-date.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
KEECHELUS LAKE INFLOW	APR-JUL	92	106	116	94	126	140	124
	APR-SEP	101	116	127	94	138	153	135
	APR-JUN	84	95	103	95	111	122	109
KACHESS LAKE INFLOW	APR-JUL	83	95	103	93	111	123	111
	APR-SEP	88	101	110	93	119	132	118
	APR-JUN	76	86	92	93	98	108	99
CLE ELUM LAKE INFLOW	APR-JUL	332	367	390	95	413	448	409
	APR-SEP	361	402	430	96	458	499	448
	APR-JUN	280	308	328	95	348	376	345
YAKIMA at Cle Elum	APR-JUN	564	627	670	93	713	776	721
	APR-JUL	651	725	775	93	825	899	832
	APR-SEP	715	795	850	93	905	985	915
BUMPING LAKE INFLOW	APR-SEP	107	122	133	98	144	159	136
	APR-JUL	101	115	124	100	133	147	124
	APR-JUN	82	95	104	100	113	126	104
AMERICAN RIVER near Nile	APR-SEP	121	134	142	120	150	163	118
	APR-JUL	110	121	129	118	137	148	109
	APR-JUN	81	91	99	107	106	116	92
RIMROCK LAKE INFLOW	APR-SEP	188	213	230	97	247	272	238
	APR-JUL	161	181	194	97	207	227	200
	APR-JUN	131	146	157	97	168	183	162
NACHES near Naches	APR-SEP	676	753	805	97	857	934	832
	APR-JUL	618	685	730	97	775	842	755
	APR-JUN	534	592	631	97	670	728	651
AHTANUM CREEK nr Tampico (2)	APR-SEP	25	37	44	96	52	63	46
	APR-JUL	24	34	41	98	48	58	42
	APR-JUN	20	29	35	97	41	50	36
YAKIMA near Parker	APR-SEP	1578	1770	1900	95	2030	2222	1994
	APR-JUL	1426	1598	1715	95	1832	2004	1805
	APR-JUN	1275	1421	1520	95	1619	1765	1597
KLICKITAT near Glenwood	APR-JUN	95	108	116	106	124	137	110
	APR-SEP	117	135	147	105	159	177	140

YAKIMA RIVER BASIN
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
KEECHELUS	157.8	129.5	107.3	96.0
KACHESS	239.0	166.3	95.8	170.0
CLE ELUM	436.9	325.7	218.3	251.0
BUMPING LAKE	33.7	8.6	8.6	9.0
RIMROCK	198.0	133.9	131.9	115.0

YAKIMA RIVER BASIN
Watershed Snowpack Analysis - March 1, 1998

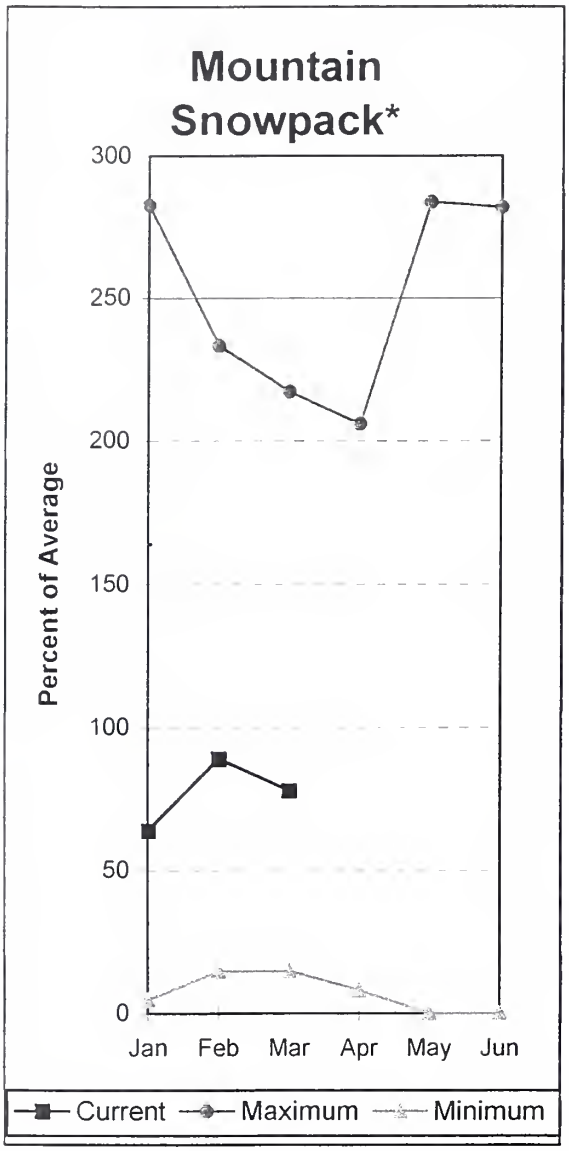
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
YAKIMA RIVER	21	60	112
AHTANUM CREEK	3	59	92

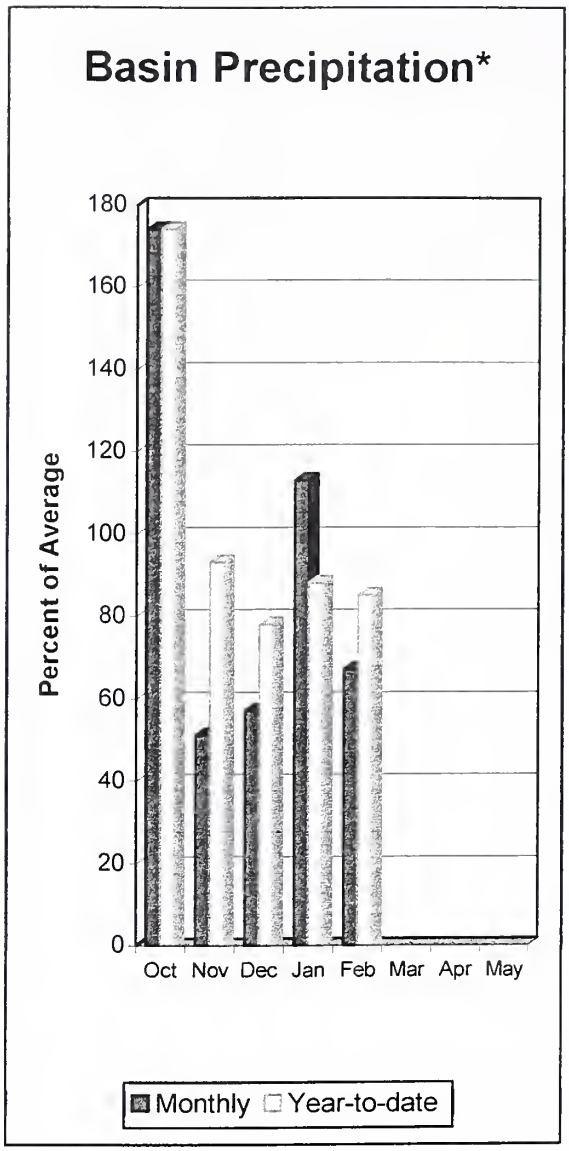
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Walla Walla River Basin





*Based on selected stations

February precipitation was 67% of average, bringing the year-to-date precipitation to 85% of average. March 1 snowpack dropped to 78% of average. The summer forecast is for 88% of average streamflow in the Snake River below Lower Granite Dam, 92% for the Grande Ronde at Troy, and 95% for Mill Creek. February streamflow was 95% of average for the Walla Walla River; 88% for the Snake River below Lower Granite Dam; and 76% for the Grande Ronde River near Troy. The Touchet SNOTEL site had 22.3 inches of snow-water-equivalent. The average March 1 reading for this site is 27.8 inches. Average temperatures were 1-2 degrees above normal for the area.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
GRANDE RONDE at Troy (1)	MAR-JUL	852	1242	1420	97	1598	1988	1471
	APR-SEP	756	1109	1270	97	1431	1784	1312
SNAKE blw Lower Granite Dam (1,2)	APR-JUL	10385	16791	19700	91	22609	29015	21650
	APR-SEP	11731	18930	22200	91	25470	32669	24360
MILL CREEK at Walla Walla	APR-SEP	9.5	14.3	17.6	103	21	26	17.1
	APR-JUL	9.3	14.1	17.4	103	21	26	16.9
	APR-JUN	9.2	14.0	17.2	103	20	25	16.7
SF WALLA WALLA near Milton-Freewater	APR-JUL	42	48	53	99	57	64	53
	APR-SEP	53	61	66	99	71	78	66

WALLA WALLA RIVER BASIN
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

WALLA WALLA RIVER BASIN
Watershed Snowpack Analysis - March 1, 1998

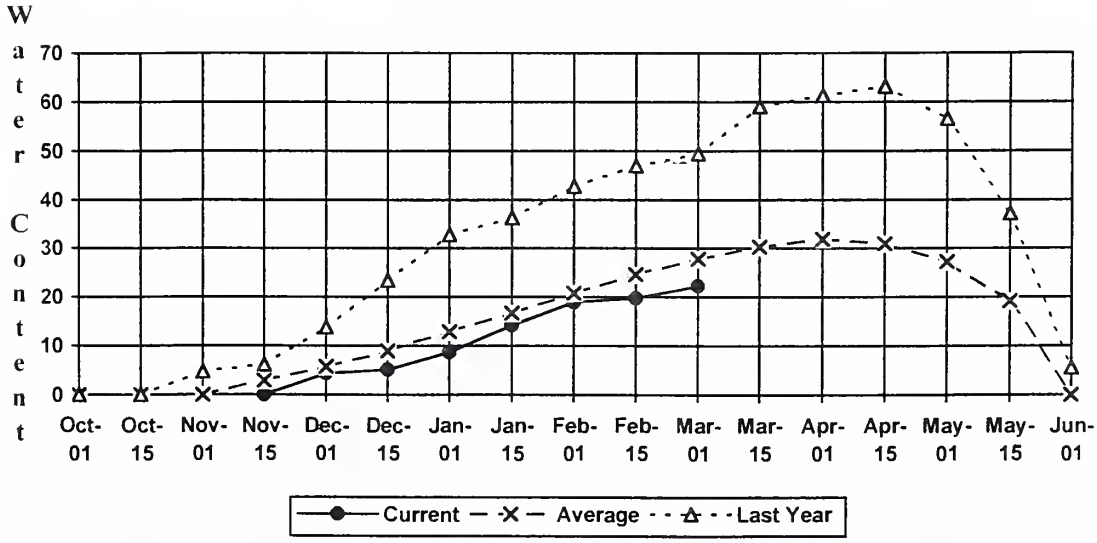
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WALLA WALLA RIVER	2	46	89

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

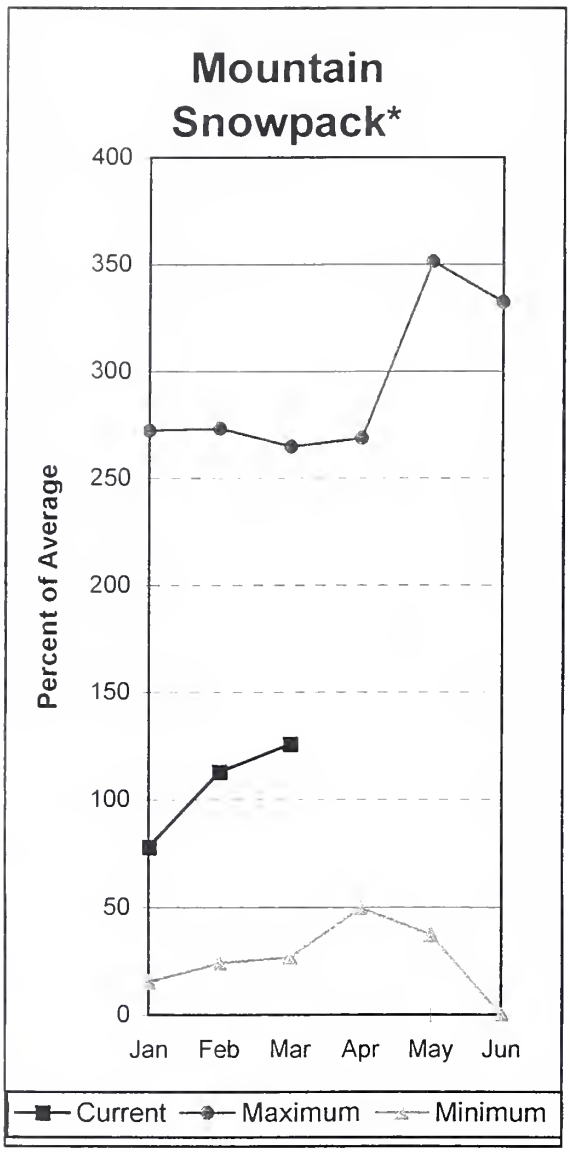
The average is computed for the 1961-1990 base period.

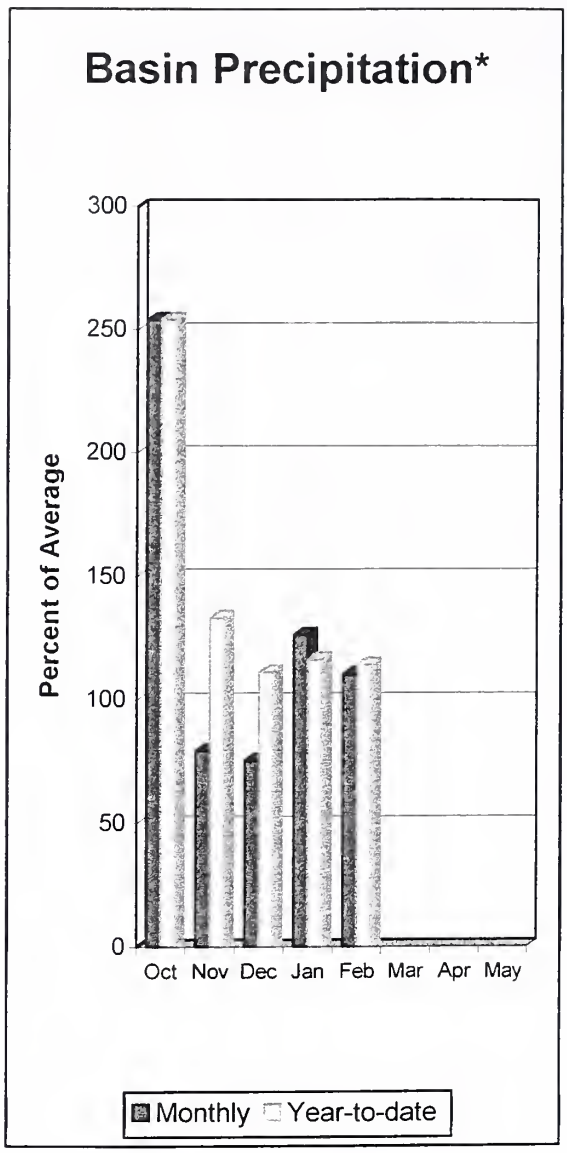
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Touchet #2 SNOTEL
Elevation 5530 ft.



Cowlitz - Lewis River Basins





*Based on selected stations

The forecast for summer runoff in the Lewis River Basin is 95% of average. The Cowlitz River at Castle Rock, is forecast for 96% of average runoff. February streamflow for the Cowlitz River was 69% of average, and 103% for the Lewis River. February precipitation was 110% of average. It was 114% of average for the water-year. March 1 snow cover for the Cowlitz River was 116%, and the Lewis River was 135% of average. The Cayuse Pass snow course recorded the most water-content for the basin with 78.3 inches of water. Average March 1 water-content is 65.3 inches. Average temperatures were near normal during February.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
LEWIS at Ariel (2)	APR-JUL	717	891	1010	96	1129	1303	1053
	APR-SEP	857	1038	1160	96	1282	1463	1206
	APR-JUN	624	788	900	96	1012	1176	935
COWLITZ R. bl Mayfield Dam (2)	APR-SEP	1082	1575	1910	97	2245	2738	1970
	APR-JUL	954	1386	1680	97	1974	2406	1731
	APR-JUN	810	1179	1430	97	1681	2050	1477
COWLITZ R. at Castle Rock (2)	APR-SEP	1600	2124	2480	93	2836	3360	2667
	APR-JUL	1392	1849	2160	93	2471	2928	2325
	APR-JUN	1195	1588	1855	93	2122	2515	1995
KLICKITAT near Glenwood	APR-JUN	95	108	116	106	124	137	110
	APR-SEP	117	135	147	105	159	177	140

COWLITZ - LEWIS RIVER BASINS
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

COWLITZ - LEWIS RIVER BASINS
Watershed Snowpack Analysis - March 1, 1998

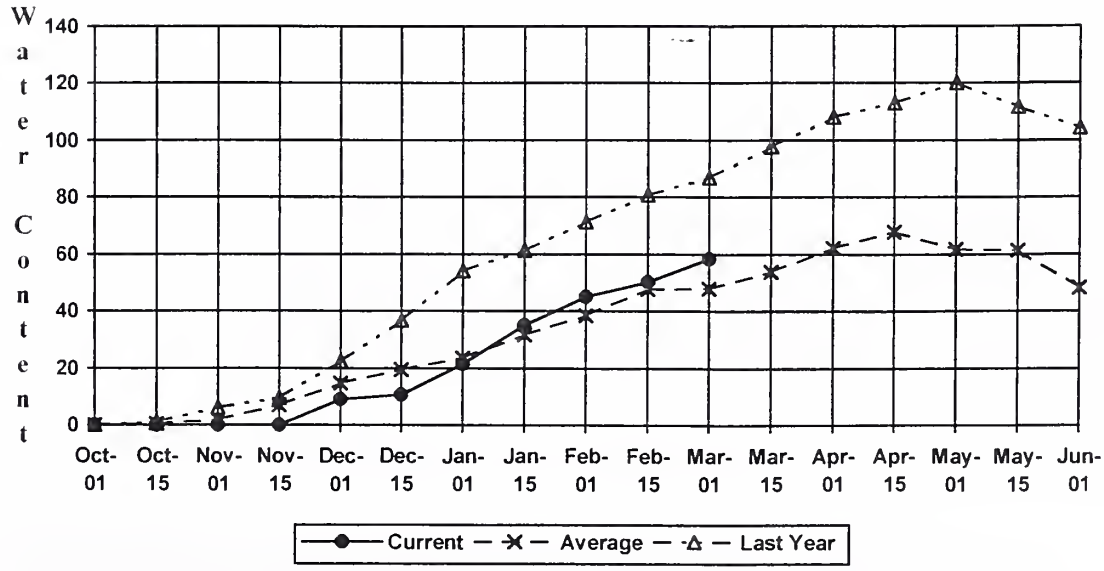
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
LEWIS RIVER	4	69	118
COWLITZ RIVER	7	63	109

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

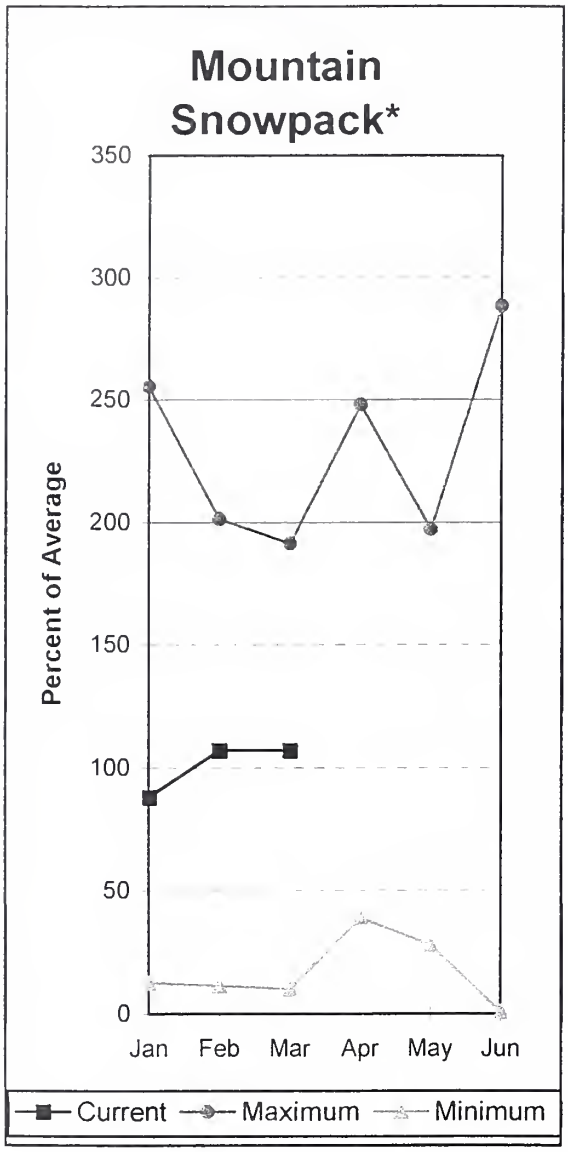
The average is computed for the 1961-1990 base period.

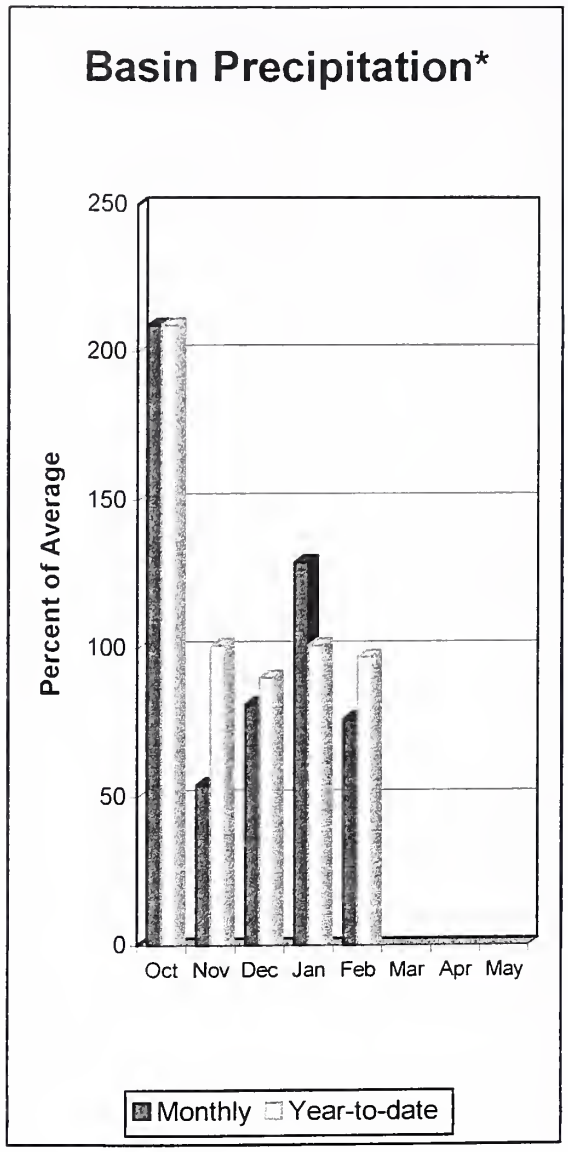
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Paridise SNOTEL
Elevation 5120 ft.



White - Green River Basins





*Based on selected stations

Summer runoff is forecast to be 83% of average for the Green River. The White and Nisqually rivers should also experience near to slightly below normal flows this summer. March 1 snowpack was 126% of average in the White River Basin; and 87% in the Green River Basin. Water-content on March 1 at the Morse Lake SNOTEL, at an elevation of 5,400 feet, was 57.4 inches. This site has a March 1 average of 38.5 inches. February precipitation was 76% of average, bringing the water year-to-date to 97% of average for the basins. February temperatures averaged near normal.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
GREEN RIVER below Howard Hanson Dam	APR-JUL	154	189	213	83	237	272	257
	APR-SEP	178	214	238	84	262	298	285
	APR-JUN	139	172	195	83	218	251	234

WHITE - GREEN RIVER BASINS
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

WHITE - GREEN RIVER BASINS
Watershed Snowpack Analysis - March 1, 1998

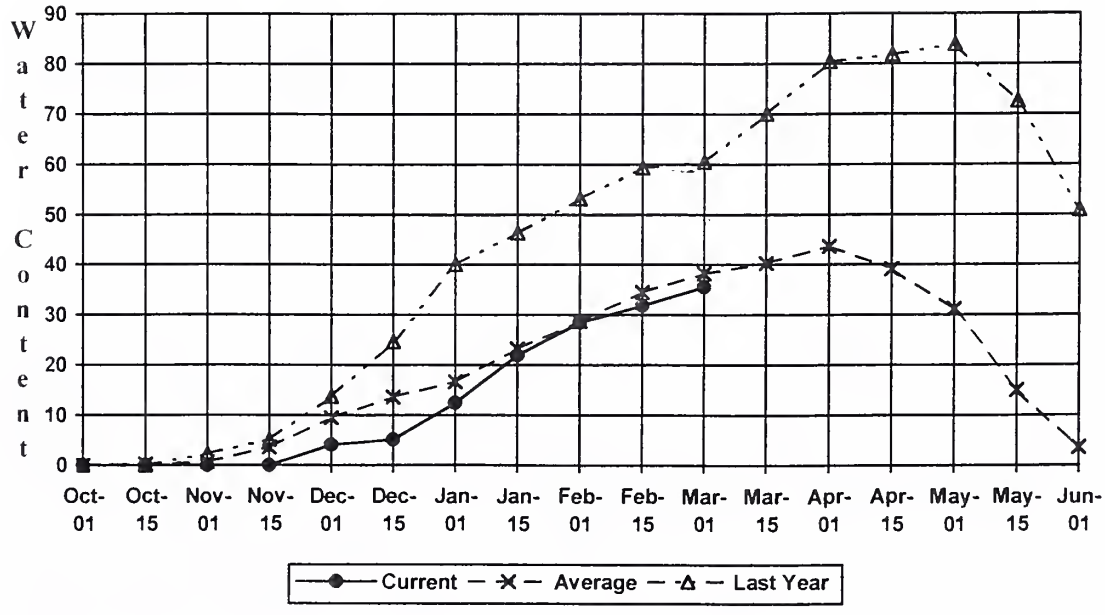
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WHITE RIVER	3	65	124
GREEN RIVER	7	55	89

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

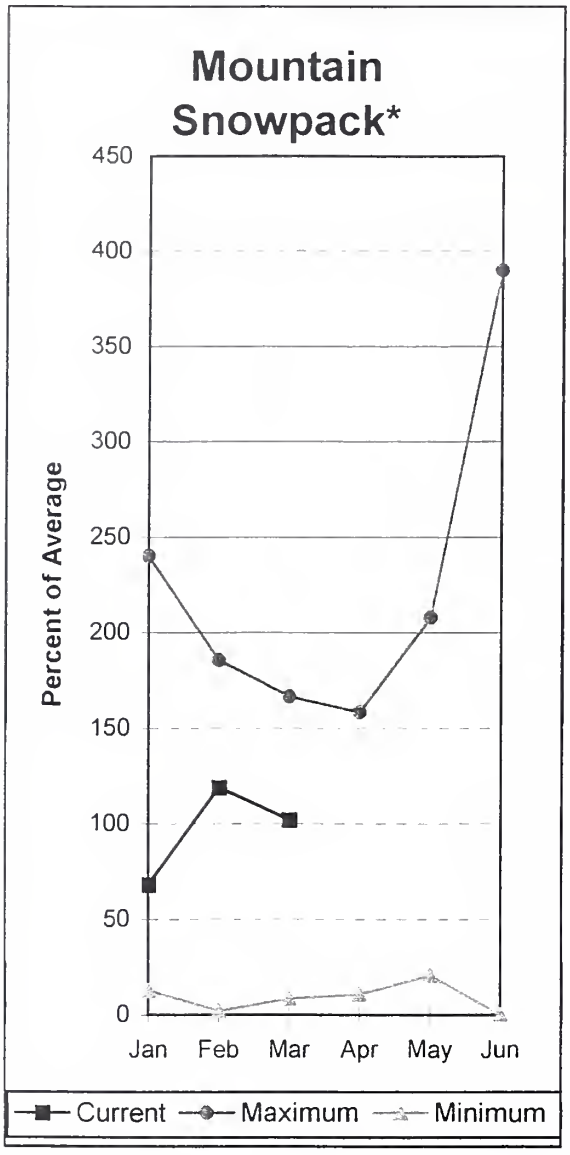
The average is computed for the 1961-1990 base period.

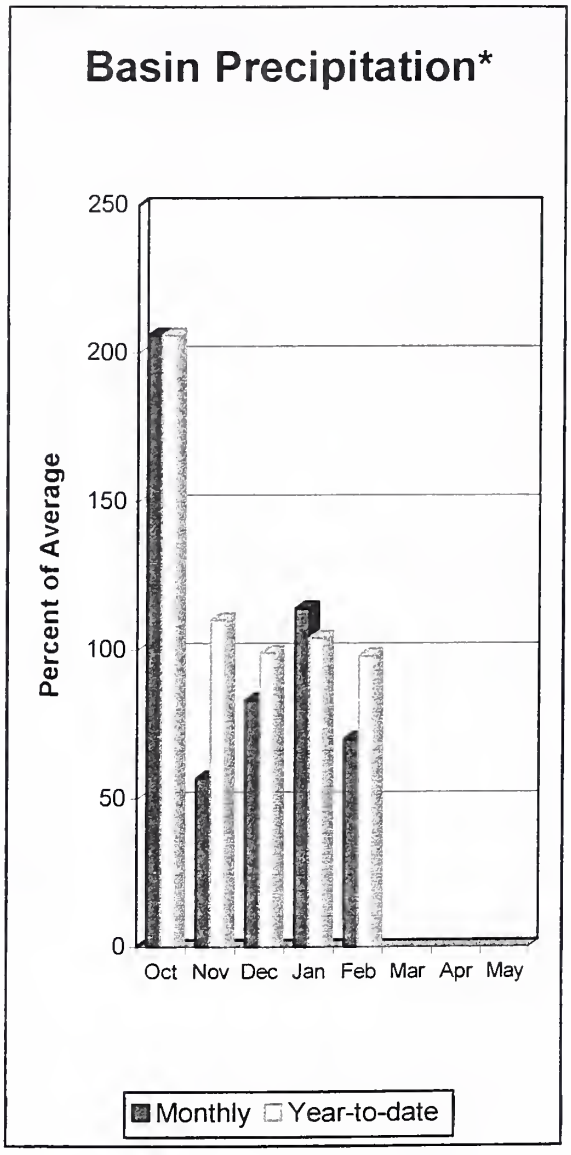
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Stampede Pass SNOTEL
Elevation 3860 ft.



Central Puget Sound River Basins





*Based on selected stations

Forecast for spring and summer flows are: 90% for the Cedar River near Cedar Falls; 89% for the Rex River: 86% for the South Fork of the Tolt River; and 89% for the Cedar River at Cedar Falls. Basin-wide precipitation for February was 70% of average, bringing water-year-to-date to 98% of average. March 1 snow cover in the Cedar River Basin was 103%; the Tolt River Basin was 103%; the Snoqualmie River Basin was 103%; and the Skykomish River Basin was 99% of average. Stevens Pass SNOTEL, at 4,070 feet, had 33.3 inches of water content. Average March 1 water content is 34.7 inches. February temperatures were 1 degree above normal.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
CEDAR near Cedar Falls	APR-JUL	48	59	67	87	75	86	77
	APR-SEP	54	66	74	88	82	94	84
	APR-JUN	44	54	60	89	67	76	68
REX near Cedar Falls	APR-JUL	14.8	19.9	23	86	27	32	27
	APR-SEP	17.2	23	26	87	30	35	30
	APR-JUN	13.4	18.1	21	86	24	29	25
CEDAR RIVER at Cedar Falls	APR-JUL	37	54	66	81	78	95	82
	APR-SEP	38	55	67	80	78	95	83
	APR-JUN	38	54	64	80	74	90	80
SOUTH FORK TOLT near Index	APR-JUL	10.0	12.0	13.3	88	14.6	16.6	15.2
	APR-SEP	12.2	14.3	15.7	88	17.1	19.2	17.8
	APR-JUN	8.7	10.6	11.8	90	13.0	14.9	13.1

CENTRAL PUGET SOUND RIVER BASINS
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

CENTRAL PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - March 1, 1998

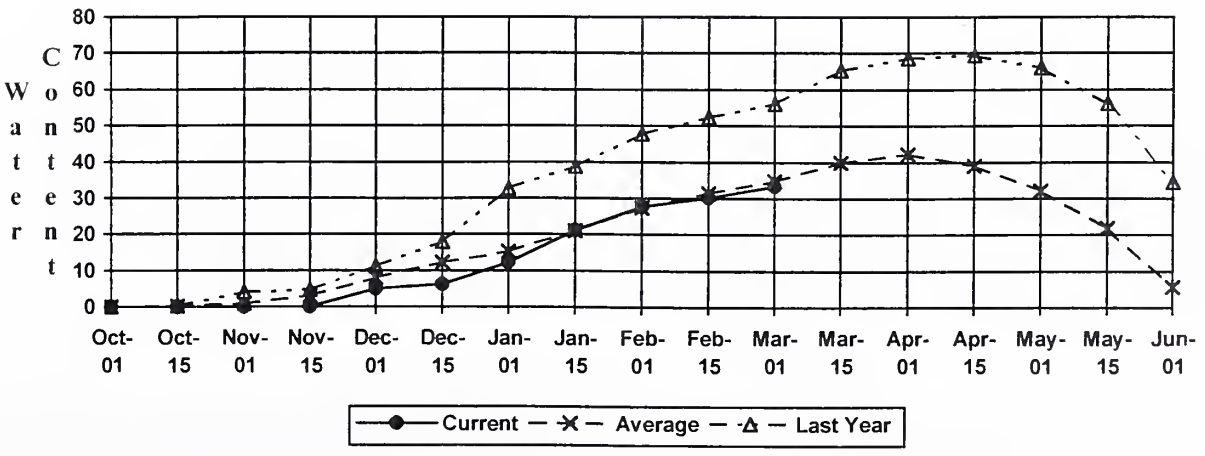
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
CEDAR RIVER	4	66	134
TOLT RIVER	2	79	112
SNOQUALMIE RIVER	5	63	106
SKYKOMISH RIVER	3	65	125

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

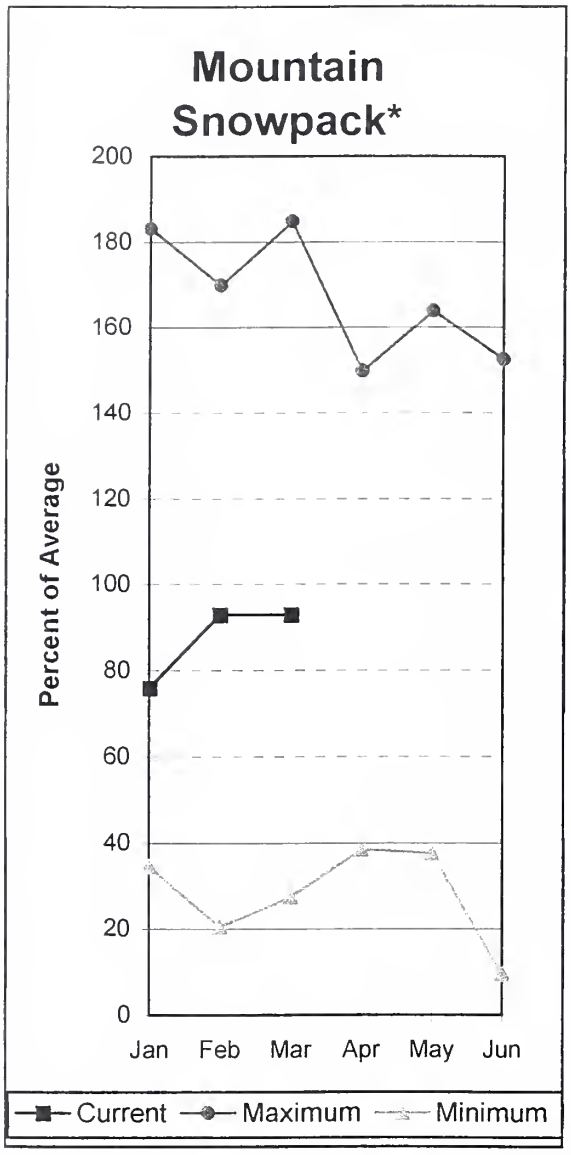
The average is computed for the 1961-1990 base period.

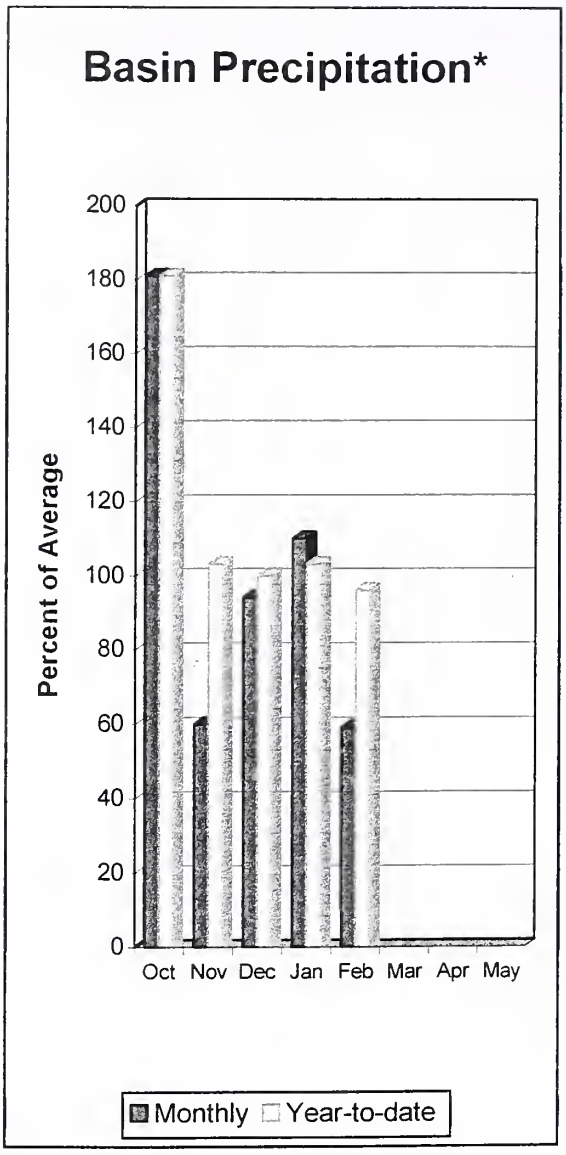
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Stevens Pass SNOTEL
Elevation 4070 ft.



North Puget Sound River Basins





*Based on selected stations

Forecast for the Skagit River streamflow is for 94% of average for the spring and summer period. February streamflow in the Skagit River was 65% of average. Other forecast points included the Baker River at 91%; and Thunder Creek at 96% of average. Basin-wide precipitation for February was only 59% of average, bringing water-year-to-date to 96% of average. March 1 snow cover in the Skagit River Basin was 100%; the Baker River Basin was 94%; and the Nooksack River Basin increased to 85% of average. Rainy Pass SNOTEL, at 4,780 feet, had 28.9 inches of water content. Average March 1 water content is 32.7 inches. March 1 Skagit River reservoir storage was 275% average and 60% of capacity. Average February temperatures were about 2 degrees above normal for the basin.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
THUNDER CREEK near Newhalem	APR-JUL	197	212	222	97	232	247	230
	APR-SEP	288	306	318	97	330	348	328
	APR-JUN	115	133	145	97	157	175	149
SKAGIT near Newhalem (2)	APR-JUL	1589	1726	1820	97	1914	2051	1879
	APR-SEP	1881	2023	2119	97	2215	2357	2191
	APR-JUN	1287	1392	1463	101	1534	1639	1455
BAKER RIVER near Concrete	APR-JUL	712	786	837	100	888	962	836
	APR-SEP	907	998	1060	100	1122	1213	1064
	APR-JUN	505	569	612	100	655	719	611

NORTH PUGET SOUND RIVER BASINS
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
ROSS	1404.1	981.0	1011.8	1033.9
DIABLO RESERVOIR	90.6	86.5	86.3	84.2
GORGE RESERVOIR	9.8	7.4	7.4	7.9

NORTH PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - March 1, 1998

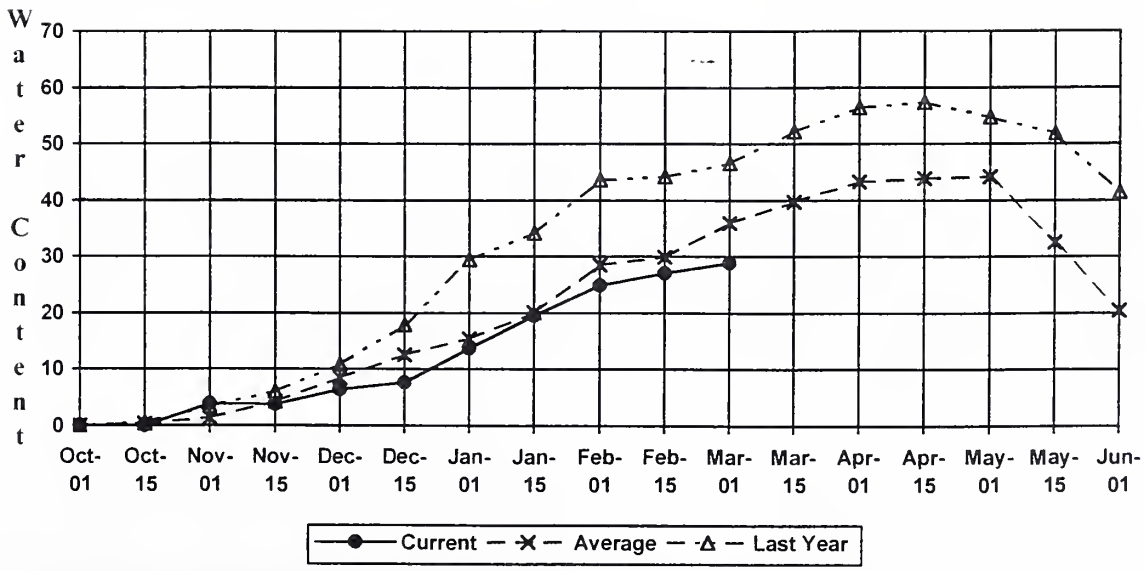
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
SKAGIT RIVER	13	62	104
BAKER RIVER	2	81	111
NOOKSACK RIVER	2	61	65

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

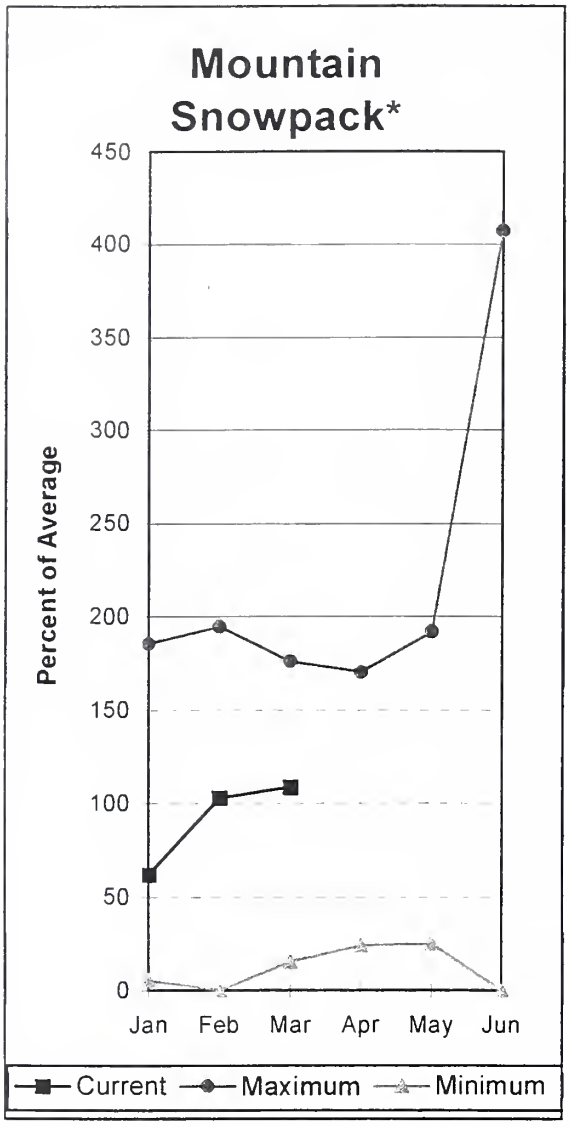
The average is computed for the 1961-1990 base period.

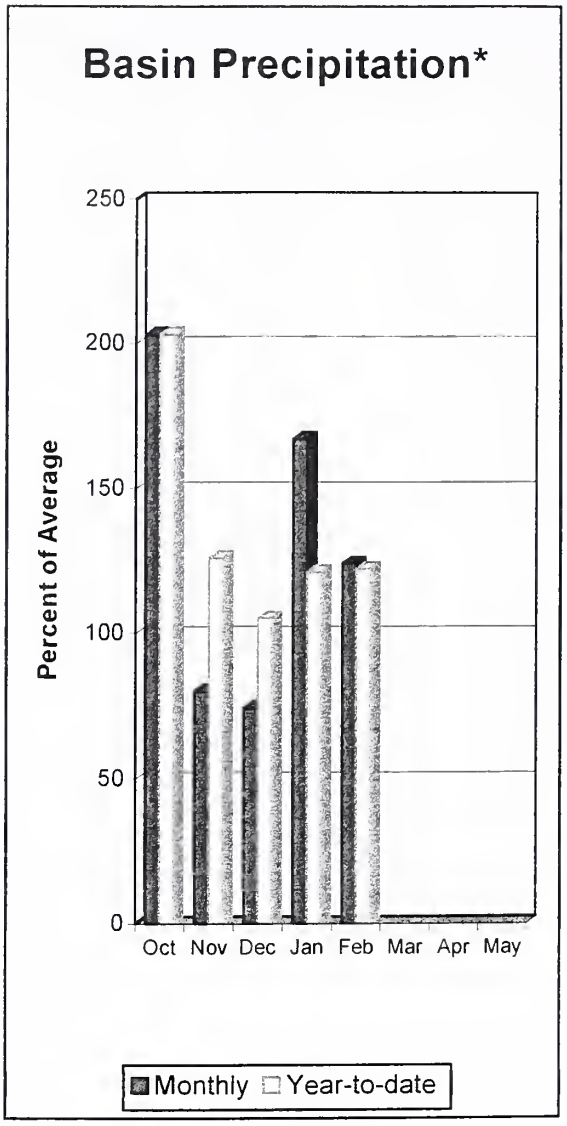
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Rainy Pass SNOTEL
Elevation 4780 ft.



Olympic Peninsula River Basins





*Based on selected stations

March forecasts of runoff for streamflow in the Dungeness River Basin are 98% of average and 96% of average for the Elwha River. The Big Quilcene and Wynoochee rivers can expect near to above average runoff this summer. February precipitation was 124% of average. Precipitation accumulated at 122% of average for the water year. February precipitation at Quillayute was 9.7 inches. The thirty-year average for March 1 is 12 inches. Average March 1 snow cover in the Olympic Basin was at 109% of average. The Mount Crag SNOTEL near Quilcene had 36.8 inches of snow-water-equivalent on March 1. Average for this site is 26.5 inches. Temperatures were 1 degree above average for the month.

For more information contact your local Natural Resources Conservation Service office.

Streamflow Forecasts - March 1, 1998

Forecast Point	Forecast Period	<<= Drier = 90% (1000AF)	70% (1000AF)	Future Conditions = Chance Of Exceeding * 50% (Most Probable) (1000AF)	(% AVG.)	= Wetter =>> 30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
DUNGENESS near Sequim	APR-SEP	131	141	148	97	155	165	153
	APR-JUL	110	118	123	98	128	136	125
	APR-JUN	78	87	92	98	98	107	94
ELWHA near Port Angeles	APR-SEP	429	469	496	97	523	563	510
	APR-JUL	360	391	412	97	433	464	424

OLYMPIC PENINSULA RIVER BASINS
Reservoir Storage (1000 AF) - End of February

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

OLYMPIC PENINSULA RIVER BASINS
Watershed Snowpack Analysis - March 1, 1998

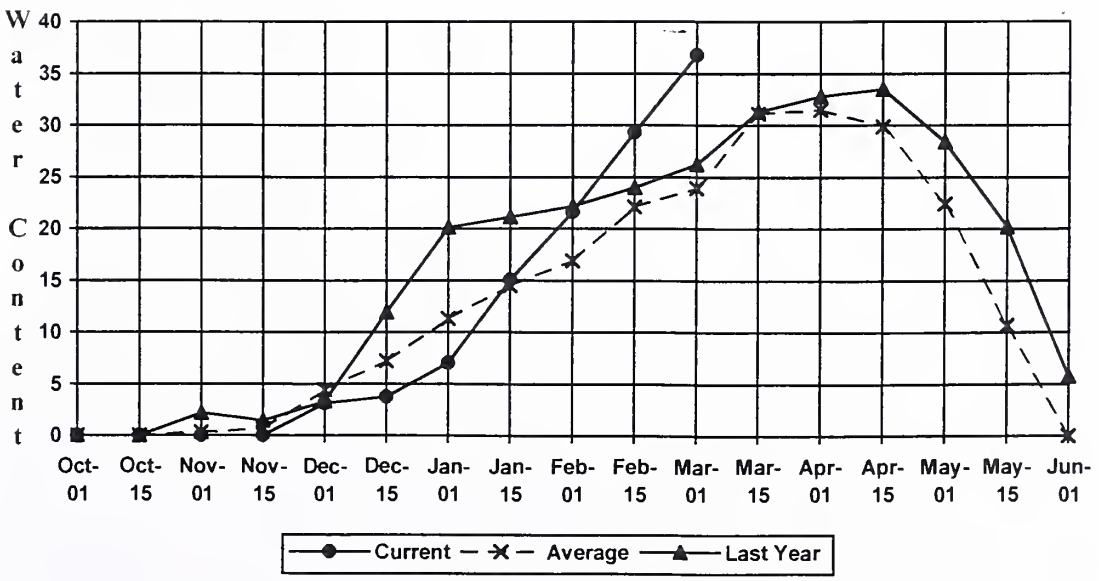
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
ELWHA RIVER	1	75	81
MORSE CREEK	1	89	112
DUNGENESS RIVER	1	90	90
QUILCENE RIVER	1	98	128
WYNOOCHEE RIVER	0	0	0

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Mount Crag SNOTEL
Elevation 4050 ft.



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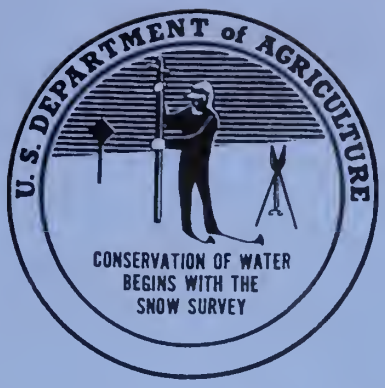
The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Ministry of the Environment Investigations Branch, Victoria, British Columbia
State	Washington State Department of Ecology Washington State Department of Natural Resources
Federal	Department of the Army Corps of Engineers U.S. Department of Agriculture Forest Service U.S. Department of Commerce NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs
Local	City of Tacoma City of Seattle Chelan County P.U.D. Pacific Power and Light Company Puget Sound Power and Light Company Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



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Washington Basin Outlook Report

Natural Resources Conservation Service
Spokane, WA